

Draft Traffic Impact Analysis

Green Apple Renewable Fuels Project

Ferndale, Washington

AECOM Project Number: 60616737

December 2019

Prepared for:

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1.0 INTRODUCTION

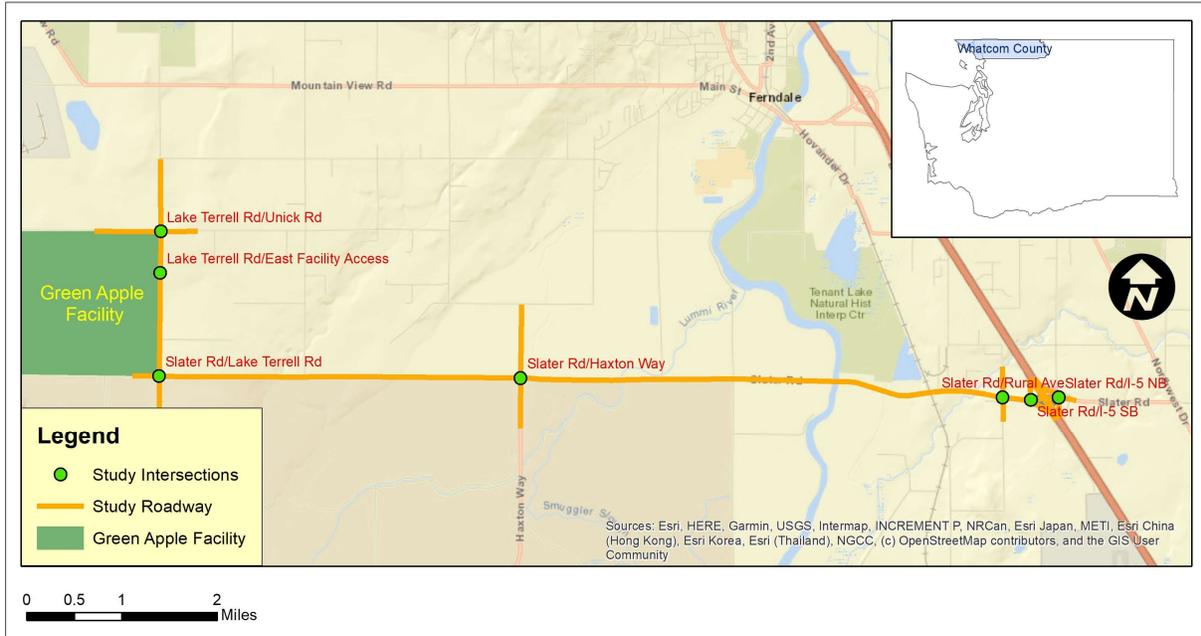
The Green Apple Renewable Fuels Project (Project) will entail construction of a manufacturing facility designed to process renewable fats, renewable oils, and renewable greases (FOG) feedstocks of varying grades to produce renewable diesel fuel. The Project will be a stand-alone design but will be located adjacent to the Phillips 66 Ferndale Refinery in Whatcom County, Washington, about 85 miles north of Seattle and 35 miles southeast of Vancouver, British Columbia. The Project will use existing infrastructure within parts of the refinery to supply utilities and infrastructure and provide waste management and logistics services for receiving renewable feedstocks and renewable product shipment.

The Project will receive shipments of renewable FOG feedstocks and transport renewable fuels products via marine vessel, rail, or tanker truck. The existing Phillips 66 Ferndale Refinery marine dock will receive shipments of renewable feedstock for the Project and will load renewable diesel from the Project onto outgoing vessels. The Project will include an expanded renewable feedstock unloading and renewable product rail-loading facilities adjacent to the existing rail facility at the Phillips 66 Ferndale Refinery. This expansion will consist of up to 34 rail renewable feedstock unloading spots, up to two new renewable diesel rail-loading spots, and up to four new renewable propane loading spots. Sufficient track for logistical movement of rail cars, along with new renewable diesel loading and renewable feedstock unloading pumps and dedicated piping, would be added.

2.0 STUDY AREA

The Phillips 66 Ferndale Refinery property is at 3901 Unick Road in Ferndale, Washington, in Whatcom County, approximately 6 miles west of Interstate 5 (I-5). The proposed Project is located entirely within the north half of the existing 817-acre fenced refinery property. The Project study area (Figure 1) was determined through discussions with Whatcom County and Washington State Department of Transportation (WSDOT) staff and is based on the quickest route of travel between the site and I-5. The limits of the study area are Lake Terrell Road/Unick Road on the north, Lake Terrell Road/Slater Road on the south, the Slater Road/I-5 northbound ramp on the east, and the Green Apple facility on the west.

Figure 1. Project Study Area



3.0 EXISTING CONDITIONS

Traffic counts were collected during PM peak hours (4 PM to 6 PM) at the intersections shown in Figure 1. Counts were taken on July 10 and 11, 2019.

Roadways within the study area generally provide one travel lane in each direction, with turn lanes at major intersections. Roadways within the study area are posted for speeds between 35 and 50 miles per hour (MPH) depending on location.

Table 1 presents a summary description of roadways within the Project study area.

Table 1. Existing Roadway Descriptions within Study Area

	Direction	Speed Limit	PM Peak Hourly Volume
Slater Road	East-West	Varies, 35 MPH to 50 MPH	1,270
Lake Terrell Road	North-South	45 MPH	381
Unick Road	East-West	35 MPH	255

Source: AECOM

Key: MPH = miles per hour

Table 2 summarizes existing controls at intersections within the study area. As indicated in the table, most of the intersections analyzed are stop-sign controlled, while a couple are traffic-signal controlled. The I-5 freeway ramps are roundabouts.

Table 2. Existing Intersection Control Type

Intersection	Control Type
Slater Road at Lake Terrell Road	All Way Stop Control
Lake Terrell Road at Unick Road	All Way Stop Control
Slater Road at Haxton Way	Signal
Slater Road at Rural Avenue	Signal
Slater Road at I-5 southbound ramp	Roundabout
Slater Road at I-5 northbound ramp	Roundabout
Project Access Location	Two Way Stop Control

Source: AECOM

Key: I-5 = Interstate 5

4.0 FIVE-YEAR CRASH ANALYSIS (2014-2018)

Crash data within the study area were obtained from WSDOT. The data indicate that 178 crashes were reported on roadways within the study area during the previous 5 years (2014–2018). Most of the reported crashes were near the I-5 freeway ramps, and no pedestrian or bicycle crashes were reported. Two fatal crashes occurred in the study area within the time period analyzed: one at the intersection of Slater Road with Haxton Way and one at the intersection of Slater Road with Ferndale Road. The total number of crashes, by year, is relatively consistent and averages about 35 crashes per year; however, the number of injuries has tended to be lower year to year. Note that about 9 percent of the reported crashes in the study area were DUI-related. A summary of the existing crash rate data is included in Appendix A.

Crash rates were calculated based on the Federal Highway Administration formula,¹ shown below:

$$R = \frac{100,000,000 \times C}{365 \times N \times V \times L}$$

Where:

R = The crash rate for the road segment expressed as crashes per 100 million vehicle-miles traveled

C = The total number of crashes in the study period

N = The number of years of data

V = The number of vehicles per day (both directions)

L = The length of the roadway segment in miles

As depicted in Figure 2, the roadways within the study area were separated into four segments. Crash rates were calculated for each of the segments.

¹ Federal Highway Administration, *Roadway Departure Safety: A Manual for Local Rural Road Owners*. January 2011.

Figure 2. Roadway Segments for Crash Rate Analysis

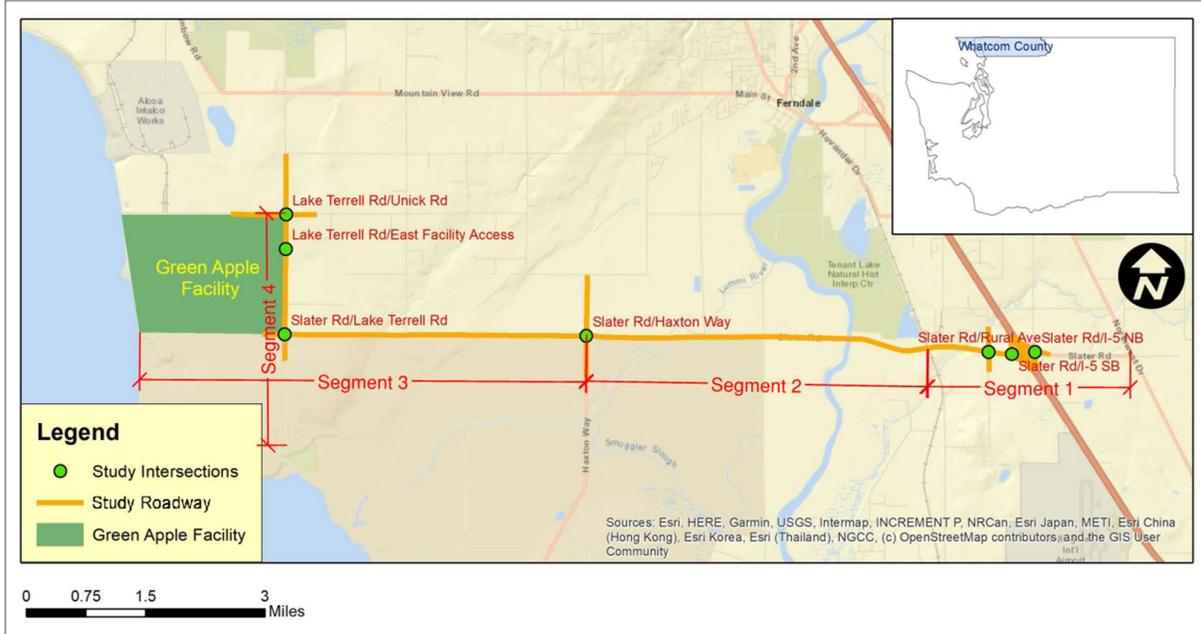


Table 3 shows the data that were used in the crash rate analysis and the results for each of the previously depicted roadway segments.

Table 3. Crash Rate by Roadway Segment

Segment	C	N	V	L (Miles)	Crash Rate
1—Slater Road from Railroad to east	97	5	16,170	1.7	192.2
2—Slater Road between Railroad and Haxton Way	44	5	10,940	2.8	78.7
3—Slater Road from Haxton Way to west	31	5	5,190	3.6	90.9
4—Lake Terrell Road	8	5	3,810	1.9	60.6

Source: AECOM

Key: C = total number of crashes; L = length of roadway; N = number of years of data; V = number of vehicles per day (both directions)

Information provided in the 2015 Washington State Annual Collision Summary indicates that Washington’s statewide crash rate is 196.2 crashes per hundred million entering vehicles. In Whatcom County, the crash rate is 175.4 crashes per hundred million entering vehicles. All crash rates on the roadways analyzed are below the statewide average. However, as shown in Table 3, the crash rate on Segment 1 (near I-5) is higher than the crash rate for Whatcom County.

5.0 PROJECT-RELATED TRAFFIC VOLUMES

5.1 Trip Generation

Trip generation for the Project was determined based on information provided by the Project applicant. The applicant indicated that the proposed Project is expected to generate fewer than 100 trips during both the AM and PM peak hours. The estimate is based on the assumptions listed below and is summarized in Table 4.

- The facility will have approximately 100 new employees and operate multiple shifts.
- No carpooling is assumed.
- Eight workers will be working 12-hour days, 5:30 AM to 5:30 PM.
- Eight workers will be working 12-hour days, 5:30 PM to 5:30 AM.
- 60 workers will work normal hours, 8:00 to 5:00 PM.
- Very few (approximately 19) trucks per day are anticipated:
 - 5 – FOG
 - 5 – Naphtha
 - 3 – Propane
 - 3 – Diesel
 - 3 – Other
- Out of the total number of trucks listed above, one inbound and one outbound truck are assumed during both the AM and PM peak hours. The remainder are assumed to occur outside of the peak hours (Table 4).

Table 4. Trip Generation Estimate

	AM Peak Hour		PM Peak hour	
	In	Out	In	Out
Cars	60	-	8	68
Trucks	1	1	1	1
Total	61	1	9	69

Source: AECOM, based on information provided by Project staff

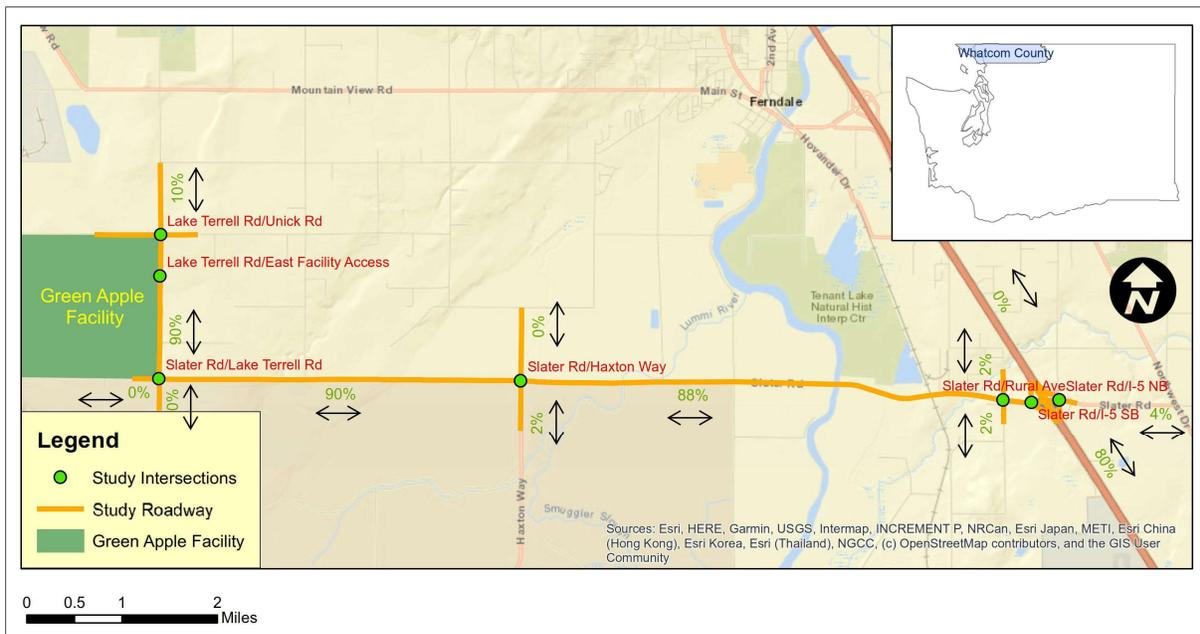
As shown in Table 4, the estimated Project-related traffic volumes are less than the total number of employees because not all the employees will work every day. For example, the eight employees working 12-hour days will not work every day of the week, and some employees will be available to cover employees on sick leave or vacation.

5.2 Trip Distribution and Assignment

Trips generated by the Project were distributed proportionally through the study area.

Figure 3 shows the proposed trip distribution percentages, which were developed by AECOM and Green Apple and approved by Whatcom County staff.

Figure 3. Project-Related Trip Distribution



6.0 PROJECT-RELATED TRAFFIC IMPACTS

For purposes of this analysis, operations at the intersections analyzed are described in terms of a Level-of-Service (LOS) grade ranging from LOS A (best) to LOS F (worst). LOS is based on an average delay experienced by drivers using the intersection during the PM peak hour. This delay is estimated empirically based on traffic volumes, lane assignment, traffic-signal phasing and other intersection features. Analysis was conducted using the principles found in the Highway Capacity Manual (HCM),² and LOS was calculated using Synchro.³

The delay estimation methodologies and LOS thresholds depend on the type of control (signalized or unsignalized) employed at the intersection. The estimated PM peak-hour average

² Transportation Research Board, *HCM 6: Highway Capacity Manual*. Washington D.C. 2010.

³ Synchro Traffic Analysis Software, Version 10, Published by Trafficware.

delay per vehicle at intersections was calculated based on the information provided in the HCM. This information is summarized in Table 5. LOS at unsignalized intersections (including driveways without traffic signals) is represented by the PM peak hour calculated delay on the worst stop-controlled approach. At signalized intersections, the delay is a weighted average delay for all approaches to an intersection. LOS D is usually considered by WSDOT as a minimum acceptable condition.

Intersection capacity analysis was conducted for the existing PM peak hour and during the anticipated opening day (2022) PM peak hour. To estimate opening-day PM peak-hour traffic volumes, an area-wide growth rate of 2 percent was added to the existing PM peak-hour traffic volumes, and analysis was conducted based on these increased traffic volumes.

Table 5. Level-of-Service Delay Ranges for Intersections

LOS	Delay Range (seconds per vehicle)	
	Unsignalized Intersections	Signalized Intersections
A	0 to 10.0	0 to 10.0
B	10.1 to 15.0	10.1 to 20.0
C	15.1 to 25.0	20.1 to 35.0
D	25.1 to 35.0	35.1 to 55.0
E	35.1 to 50.0	55.1 to 80.0
F	50.1 or more	80.1 or more

Source: HCM 6 Key; LOS = level of service

As indicated in Table 6, all the intersections analyzed are expected to operate in an acceptable manner through the 2022 PM peak hour. By 2022, the most congested location is expected to be the roundabout at Slater Road with the I-5 northbound ramp, which is expected to operate at LOS C with or without the Project; all other intersections are expected to operate at LOS B or better during the PM peak hour through 2022.

Table 6. Intersection Delay and Level of Service–Opening Day (2022)

Intersection	Existing (2019)		Future without Project (2022)		Future with Project (2022)	
	Int. Delay (sec)	LOS	Int. Delay (sec)	LOS	Int. Delay (sec)	LOS
Lake Terrell Rd / Slater Rd	10.0	A	10.4	B	11.7	B
Lake Terrell Rd / Unick Rd	9.9	A	10.3	B	10.3	B
Slater Rd / Haxton Way	13.7	B	14.6	B	15.7	B
Slater Rd / Rural Ave	14.0	B	15.0	B	16.1	B
Slater Rd / I-5 SB Ramp	11.2	B	12.5	B	13.2	B
Slater Rd / I-5 NB Ramp	12.9	B	15.3	C	15.8	C
Lake Terrell Rd / New Access	-	-	-	-	10.8	B

Source: AECOM

Key: I-5 = Interstate 5; LOS = level of service; NB = northbound; Rd = Road; SB = southbound; sec = second

Existing traffic volume count data can be found in Appendix B, while intersection capacity analysis results are included in Appendix C.

Table 7 presents projected intersection capacity analysis results for 2039. If the aforementioned 2 percent annual growth rate is accurate over the 20-year time frame, most intersections in the study area will continue to operate at an acceptable level of service (LOS D or better) during the PM peak hour. However, the roundabouts at the I-5 ramp termini would be expected to operate at LOS F by this time.

Table 7. Intersection Delay and Level of Service–Horizon Year (2039)

Intersection	Existing (2019)		Future without Project (2039)		Future with Project (2039)	
	Int. Delay (sec)	LOS	Int. Delay (sec)	LOS	Int. Delay (sec)	LOS
Lake Terrell Rd / Slater Rd	10.0	A	15.0	B	19.3	C
Lake Terrell Rd / Unick Rd	9.9	A	14.9	B	15.0	B
Slater Rd / Haxton Way	13.7	B	39.7	D	46.5	D
Slater Rd / Rural Ave	14.0	B	43.9	D	54.9	D
Slater Rd / I-5 SB Ramp	11.2	B	47.1	E	52.7	F
Slater Rd / I-5 NB Ramp	12.9	B	108.8	E	112.6	F
Lake Terrell Rd / New Access	-	-	-	-	12.1	B

Source: AECOM

Key: I-5 = Interstate 5; LOS = level of service; NB = northbound; Rd = Road; SB = southbound; sec = second

7.0 RAIL CROSSING IMPACTS

Access to the Phillips 66 Ferndale Refinery is provided via an existing single-track private rail line owned by Phillips 66 that connects to a BNSF railroad spur line at Unick Road. The spur line (Custer Spur) extends from Unick Road approximately 8.5 miles north and east to Custer, where it intersects a double-track railroad segment owned and operated by BNSF. The spur has 11 at-grade road crossings and also serves the BP Cherry Point Refinery, Petrogas Ferndale Terminal, and Alcoa Intalco Works.

The BNSF rail line through Custer roughly parallels I-5 and connects the BNSF transcontinental mainline in Everett with Bellingham, Ferndale, Blaine, and Vancouver, Canada. North of Ferndale, the railroad track parallels Portal Way, a regional road that also parallels I-5. The railroad speed limit is 50 MPH. Between Ferndale and Blaine, there are 10 at-grade road crossings of the BNSF rail line, each of which is protected by active warning devices, including flashing red lights and gate arms, as well as passive warning devices such as signs and pavement markings.

Information provided by BNSF indicates that there is one daily manifest train serving the site via the Custer Spur, and that the train usually has between 60 and 100 cars with travel speeds of between 10 and 20 miles per hour.

It is anticipated the Project will add a maximum of 28 cars daily on the manifest train serving the Custer Spur (28 cars inbound and 28 cars outbound in a day for 56 total daily cars). Note that, all 28 additional cars would only be needed if all feedstock came into the Project site via rail.

As part of this analysis, existing train roadway crossing times were estimated for three cases—100 cars, 80 cars, and 60 cars—assuming travel speeds of 10, 15, and 20 MPH. Other assumptions included in the analysis are as follows:

- Locomotives are assumed to be 75 feet long, and each train is assumed to have a single locomotive.
- The type of cars contained in the train is not given, so it is assumed that each car is 55.5 feet in length.
- The gate operation time is assumed to be approximately 47 seconds, which includes 4 seconds of advanced warning bells, 6 seconds of gate down time, 25 seconds clear out time prior to train arrival, and 12 seconds for vehicle checkout/gate up time.

Crossing times for the existing manifest train were estimated based on the information above and are documented in Table 8.

Table 8. Existing Estimated Train Crossing Times

Number of Cars	Train Length (ft)	Train Crossing Speed (MPH)	Train Crossing Time (seconds)	Gate Operations Time (seconds)	Total Crossing Time (seconds)
60	3,405	10	232	47	279
		20	116	47	163
		30	77	47	124
80	4,515	10	308	47	355
		20	154	47	201
		30	103	47	150
100	5,625	10	384	47	431
		20	192	47	239
		30	128	47	175

Source: AECOM

Key: ft = feet; MPH = miles per hour

As indicated in Table 8, estimated train crossing times are expected to vary greatly depending on the assumed train length and crossing speeds. Shorter trains travelling at higher speeds are expected to shorten crossing times, while a longer train travelling at a slower speed would be expected to take longer to cross. For example, a 60-car train travelling at 30 MPH would be expected to take approximately 124 seconds (just over 2 minutes) to make the crossing, while a 100-car train travelling at 10 MPH would be expected to take about 431 seconds (over 7 minutes) to make the crossing.

The analysis was repeated using the same methodology but assuming that 28 extra cars are added to the existing manifest train (Table 9). As expected, estimated train travel times through the affected roadway crossings would increase due to the increased train length.

Table 9. Estimated Train Crossing Times with 28 Additional Cars

Number of Cars	Train Length (ft)	Train Crossing Speed (MPH)	Train Crossing Time (seconds)	Gate Operations Time (seconds)	Total Crossing Time (seconds)
88	4,959	10	338	47	385
		20	169	47	216
		30	113	47	160
108	6,069	10	414	47	461
		20	207	47	254
		30	138	47	185
128	7,179	10	489	47	536
		20	245	47	292
		30	163	47	210

Source: AECOM

Key: ft = feet; MPH = miles per hour

As indicated in Table 9, an 88-car train travelling at 30 MPH would be expected to take approximately 160 seconds (about 2.7 minutes) to make the crossing, while a 128-car train travelling at 10 MPH would be expected to take about 536 seconds (just under 9 minutes) to make the crossing. Overall, it is expected that train crossing times would increase between 20 and 40 percent over the current crossing times, depending on the train lengths and speed.

8.0 TRAFFIC-RELATED CONSTRUCTION IMPACTS

Project construction is estimated to start during the fourth quarter of 2020 and be completed by the third quarter of 2022, subject to receipt of agency permit and approvals. During this time, additional worker and truck traffic would be expected.

Information provided by the applicant indicates that the peak construction period would be during the second and third quarters of 2021. During this time period, the following daily truck and vehicular volumes may be expected:

- During the second quarter of 2021:
 - 690 car trips per day (employees and vendors)
 - 165 truck trips per day
- During the third quarter of 2021:
 - 1,015 car trips per day (employees and vendors)
 - 65 truck trips per day

Since the bulk of the trips to/from the site during this time period are by employees, it can be expected that most of the outbound trips would likely occur during the PM peak hour. If the

aforementioned number of vehicular and truck trips are accurate, they will likely result in increased congestion and potentially unacceptable PM peak-hour operations at the Project access location and at the I-5 freeway ramps on Slater Road. It is possible that traffic-related impact mitigation could be accomplished via one or more Traffic Demand Management (TDM) strategies.

TDM includes a wide range of programs and services that make the most efficient use of existing transportation facilities by managing the actual “demand” placed on these facilities. Using strategies that promote alternative modes, increase vehicle occupancy, reduce travel distances, and ease peak-hour congestion, TDM strategies could be used to reduce the actual number of vehicular trips to/from the site and improve air quality. Some applicable/potential TDM strategies may include:

- Vanpool in conjunction with an off-site parking facility;
- Development of a carpool/rideshare program for employees; and/or
- Variable work hours.

Prior to beginning of construction, Project staff may want to meet with local jurisdictional staff to identify and evaluate potential TDM strategies that could help reduce the daily and peak-hour trips to/from the site.

9.0 CONCLUSIONS AND RECOMMENDATIONS

This report was prepared to assess the traffic-related impacts of the proposed Green Apple Renewable Fuels Project to be constructed adjacent to the existing Phillips 66 Ferndale Refinery near Ferndale, Washington. Key results contained in this analysis include the following:

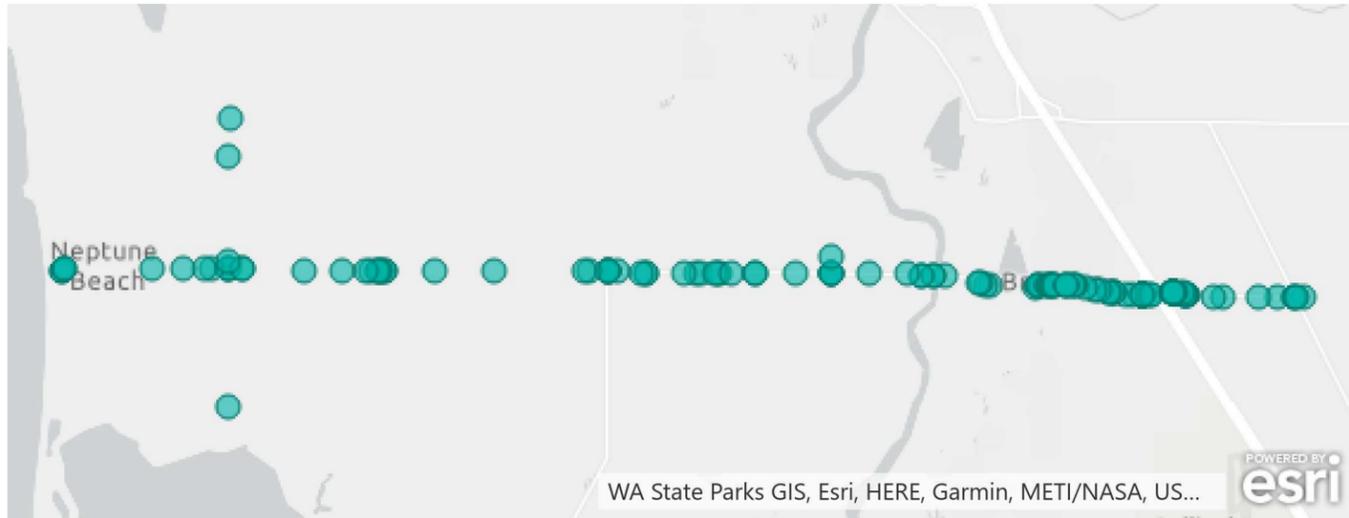
- The proposed Project is expected to generate fewer than 100 trips during both the AM and PM peak hours.
- All study area intersections are expected to operate in an acceptable manner through the 2022 PM peak hour. By 2022, the most congested location is expected to be the roundabout at Slater Road with the I-5 northbound ramp, which is expected to operate at LOS C in 2022 with or without the Project. All other intersections are expected to operate at LOS B or better during the PM peak hour through 2022. No Project-related mitigation is required.
- If area-wide traffic volumes grow at a yearly rate of about 2 percent through 2039, most intersections would be expected to operate at an acceptable LOS during the PM peak hour. The exceptions would be the roundabouts at the I-5 ramp termini, which would be expected to operate at an unacceptable LOS E or F with or without the project.
- There were a total 178 crashes reported on roadways within the study area during the previous 5 years (2014–2018). Most of the reported crashes were near the I-5 freeway ramps, and no pedestrian or bicycle crashes were reported.
- Information provided by BNSF indicates that there is one daily manifest train serving the site via the Custer Spur. The train usually has between 60 and 100 cars and travels between 10 and 20 MPH.
- The Project will be expected to add 28 cars daily to the one existing manifest train serving the site. Analysis was conducted to estimate the potential increases in gate down times resulting from the additional train lengths. It is expected that roadway crossing times will increase between 20 and 40 percent if 28 additional cars were added.

This would occur twice per day (one train inbound and one train outbound). Increases to the existing crossing times will vary depending on the train lengths and speed. No mitigation is proposed.

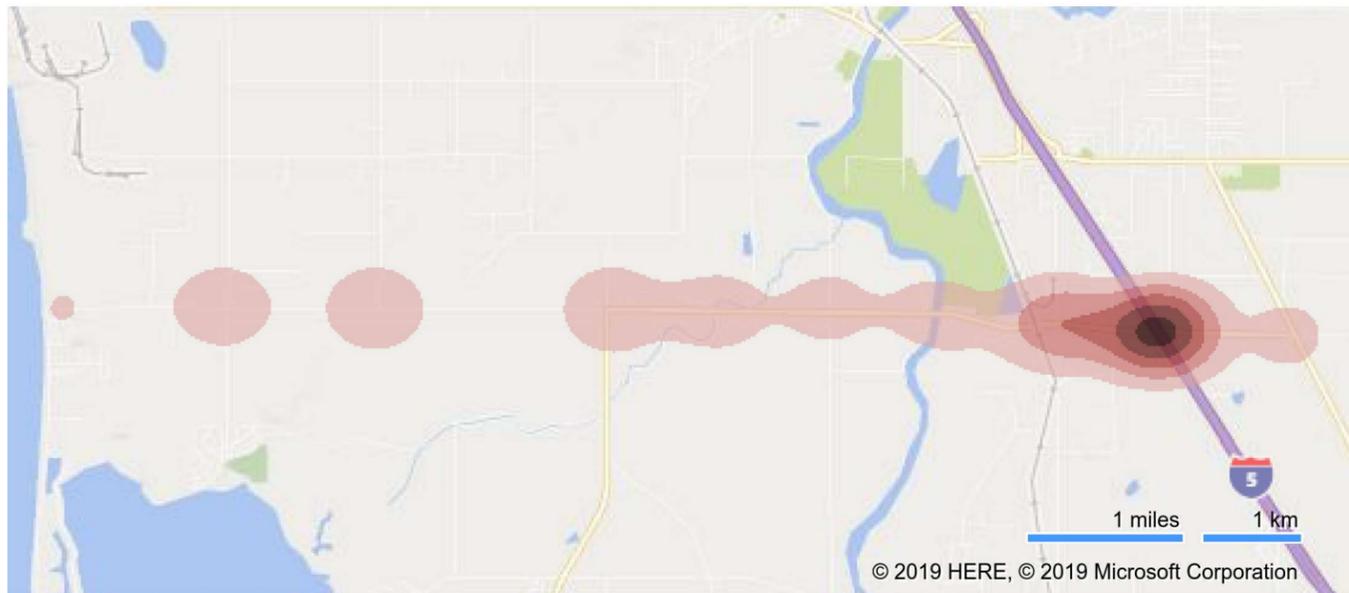
- It is anticipated that during construction, Project-related traffic could impact traffic operations at both the site access location and at the I-5 freeway ramps on Slater Road. It is recommended that Project staff meet with local jurisdictions to discuss potential TDM strategies that could be used to reduce Project-related traffic impacts and improve local traffic operations.

Appendix A. Crash Analysis Data

Crash Location



Crash Heatmap



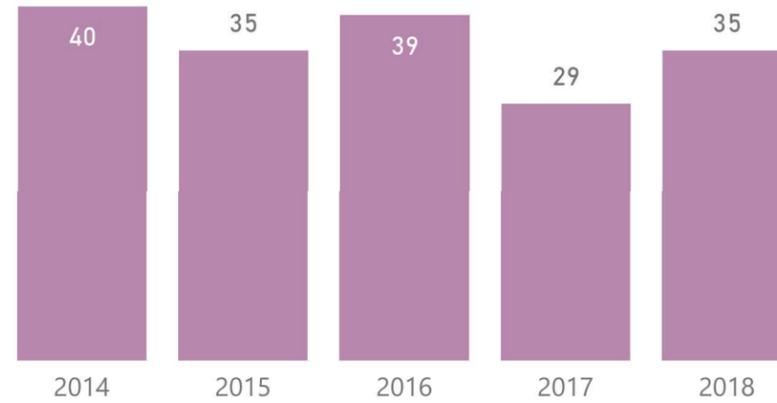
Crashes by Time of Day



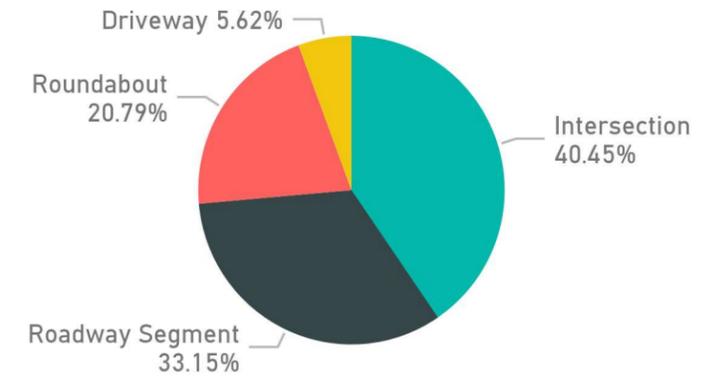
Number of Crashes

178

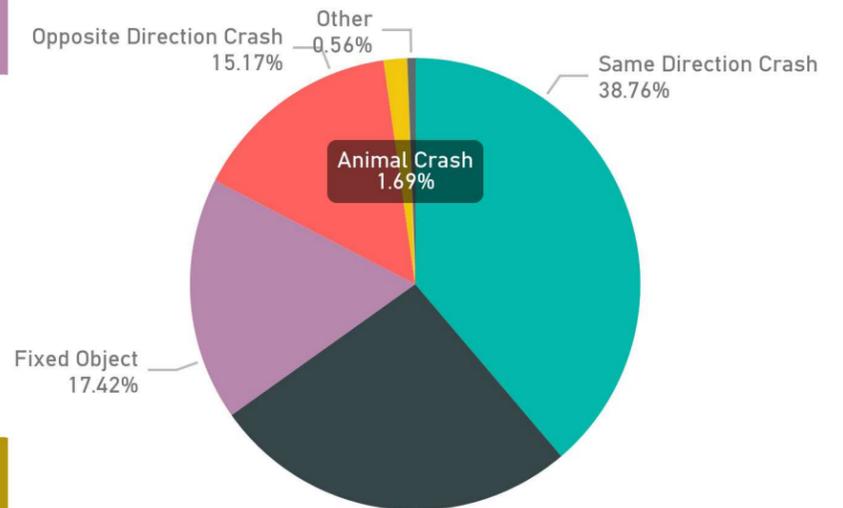
Crashes by Year



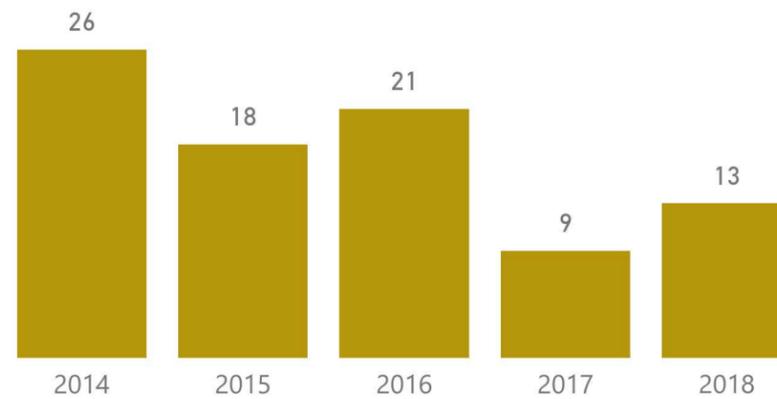
Intersection Relationship



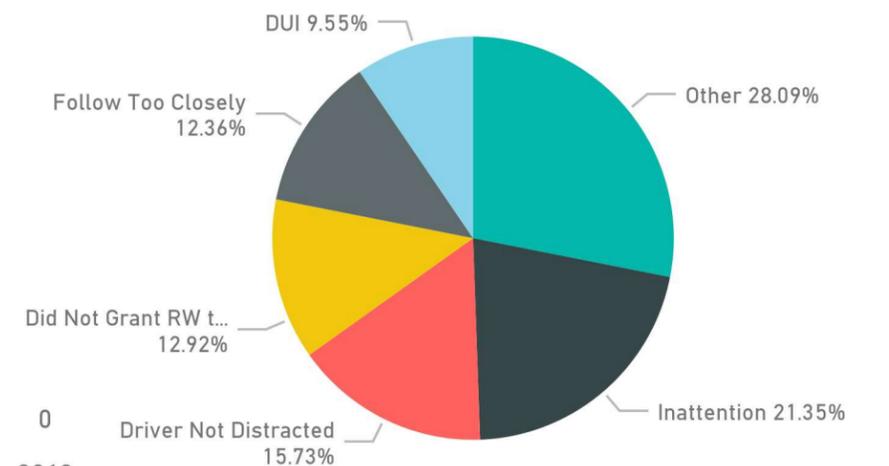
Collision Type



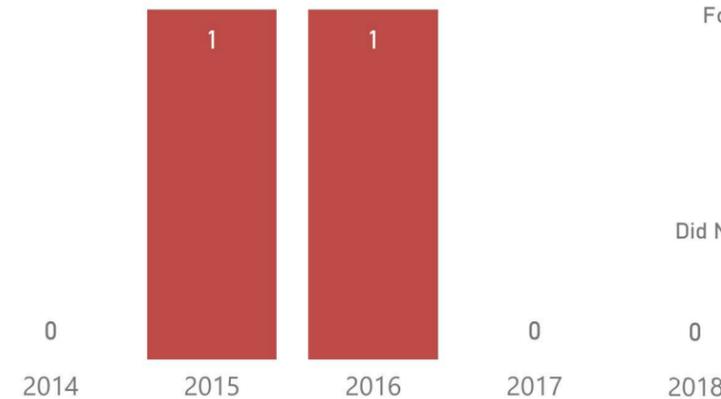
Number of Injuries by Year



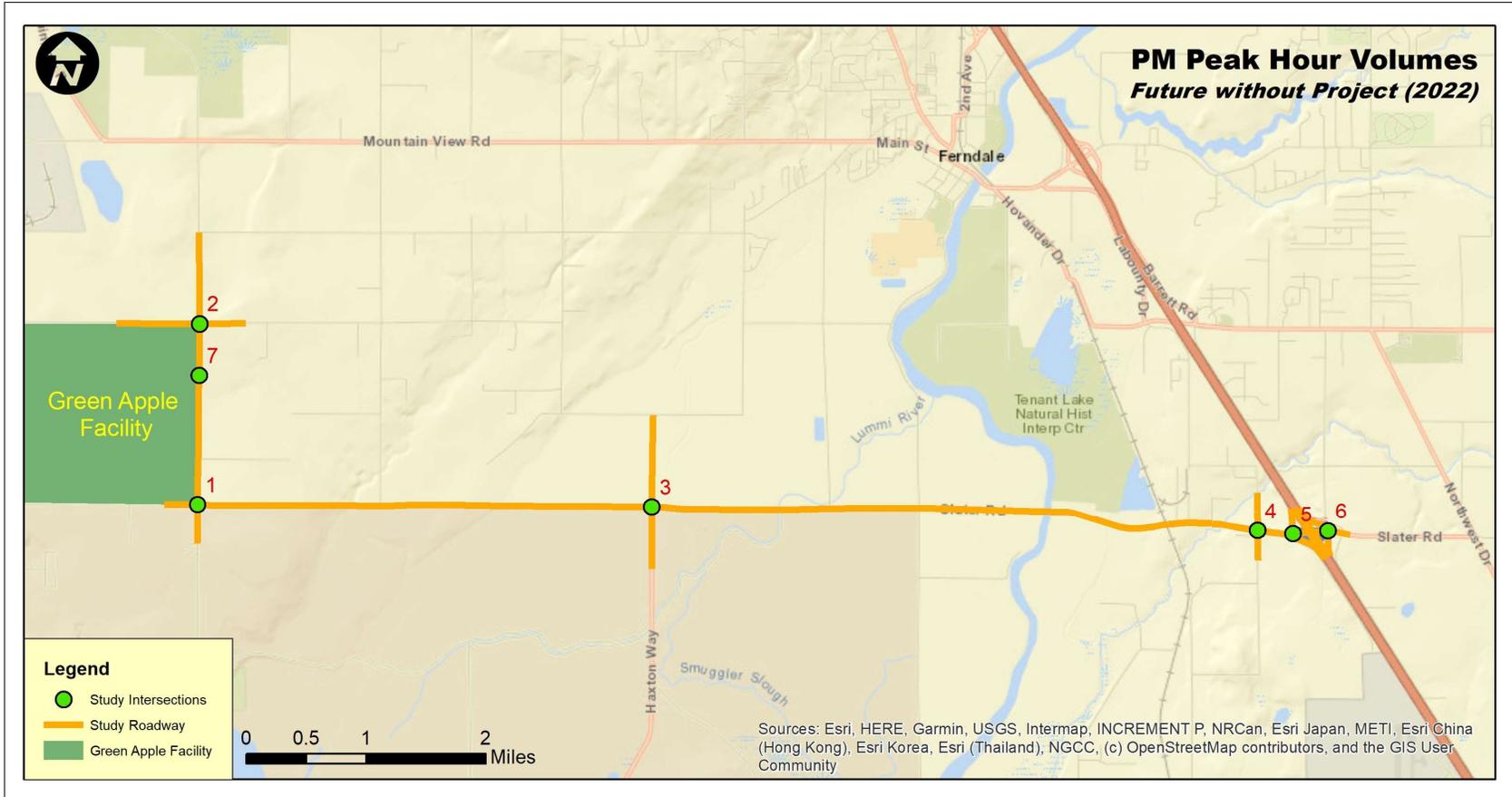
Driving Conditions



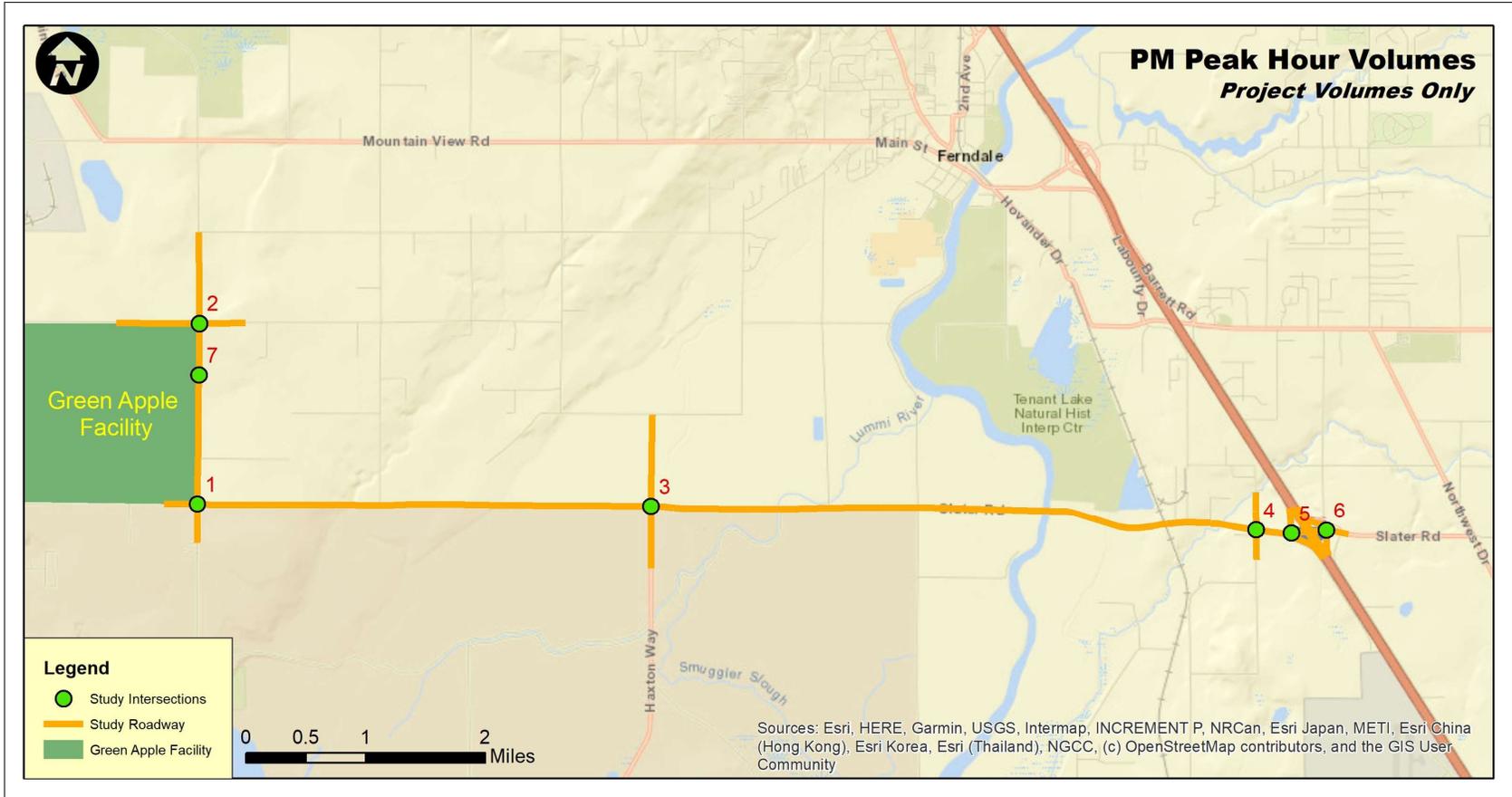
Number of Fatalities by Year



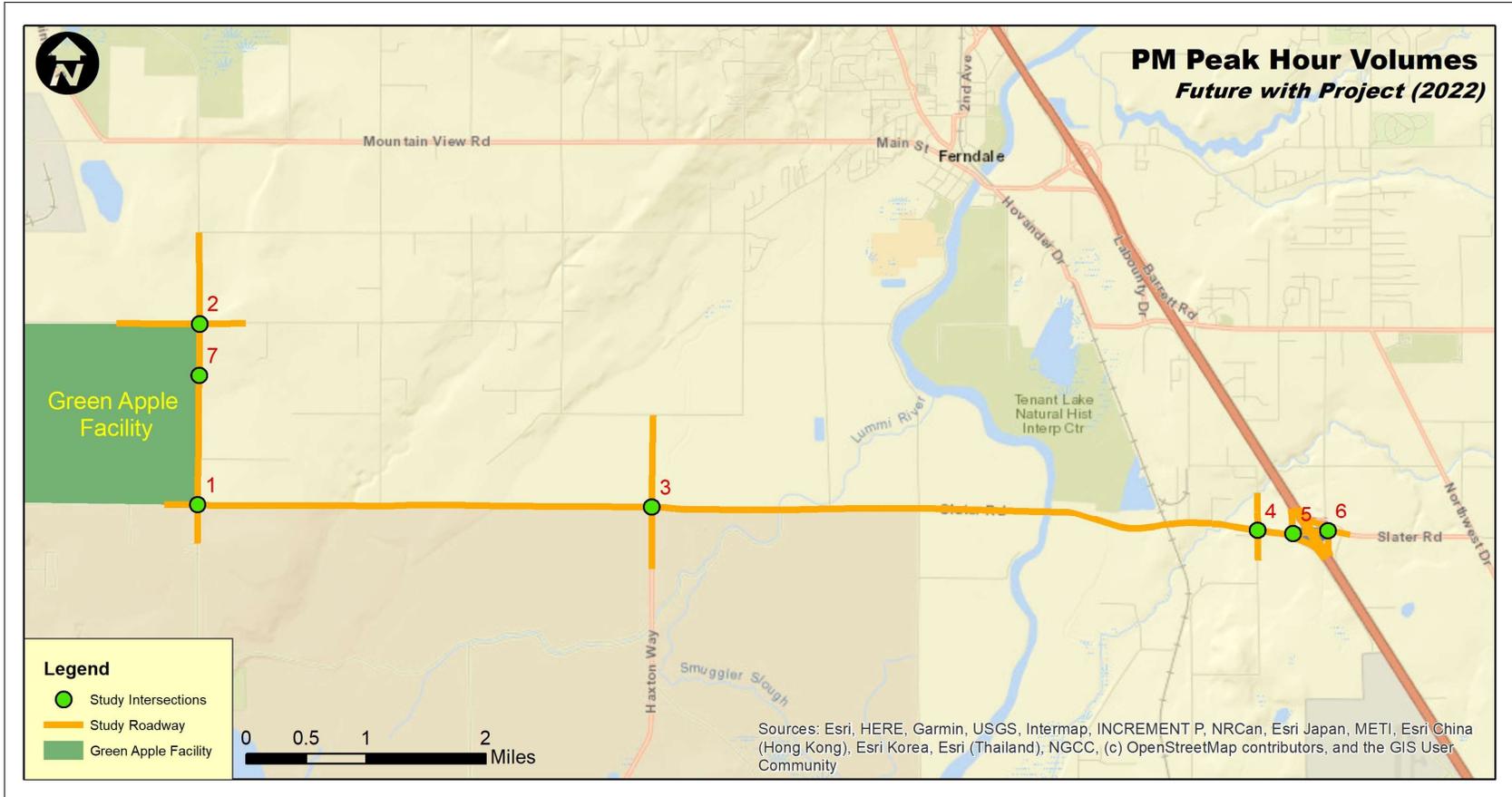
Appendix B. PM Peak Hour Traffic Volumes



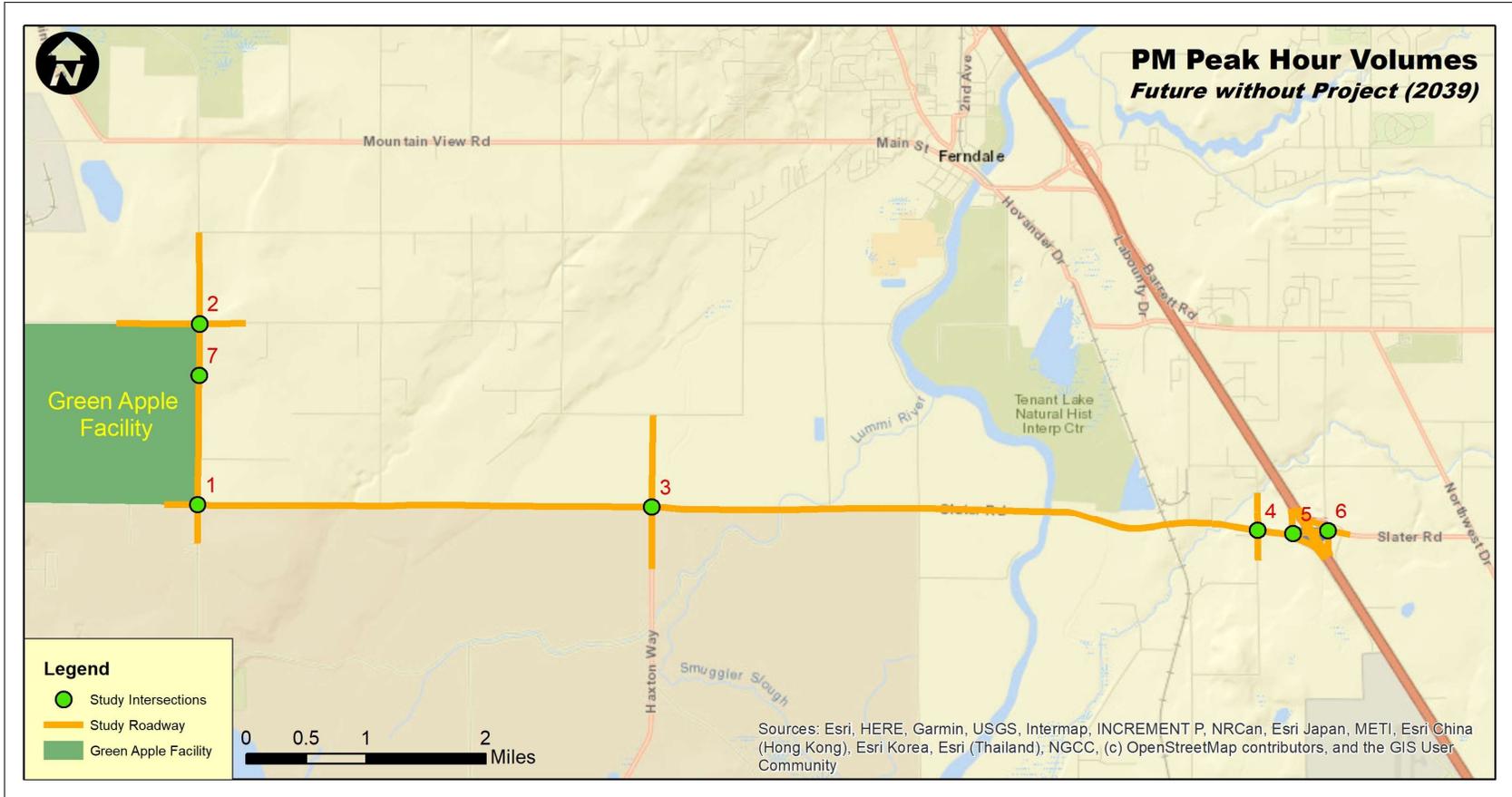
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↓	↓	↓	↑	↑	↑	↓	↓	↓	↑	↑	↑	↓	↓	↓	↑	↑	↑	↓	↓	↓	↑	↑	↑
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↓	↓	↓	↑	↑	↑	↓	↓	↓	↑	↑	↑	↓	↓	↓	↑	↑	↑	↓	↓	↓	↑	↑	↑
0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	62	0	0
↓	↓	↓	↑	↑	↑	↓	↓	↓	↑	↑	↑	↓	↓	↓	↑	↑	↑	↓	↓	↓	↑	↑	↑
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
↓	↓	↓	↑	↑	↑	↓	↓	↓	↑	↑	↑	↓	↓	↓	↑	↑	↑	↓	↓	↓	↑	↑	↑
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
↓	↓	↓	↑	↑	↑	↓	↓	↓	↑	↑	↑	↓	↓	↓	↑	↑	↑	↓	↓	↓	↑	↑	↑
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
↓	↓	↓	↑	↑	↑	↓	↓	↓	↑	↑	↑	↓	↓	↓	↑	↑	↑	↓	↓	↓	↑	↑	↑



1		2		3		4		5		6		7	
30	316	83	4	2	15	37	146	126	87	0	0	155	0
19	19	76	13	1	36	27	18	612	1	670	0	503	0
↓	↓	58	↓	0	↓	275	↓	56	↓	216	↓	0	0
13	↑	120	↑	1	↑	22	↑	0	↑	108	↑	7	↑
42	↑	5	↑	381	↑	772	↑	352	↑	331	↑	0	↑
2	↑	144	↑	55	↑	12	↑	636	↑	0	↑	62	↑
3	16	45	5	109	0	62	52	20	17	70	0	383	4
218	218	218	218	218	218	218	218	218	218	218	218	218	218
8	104	0	8	104	0	8	104	0	8	104	0	8	104



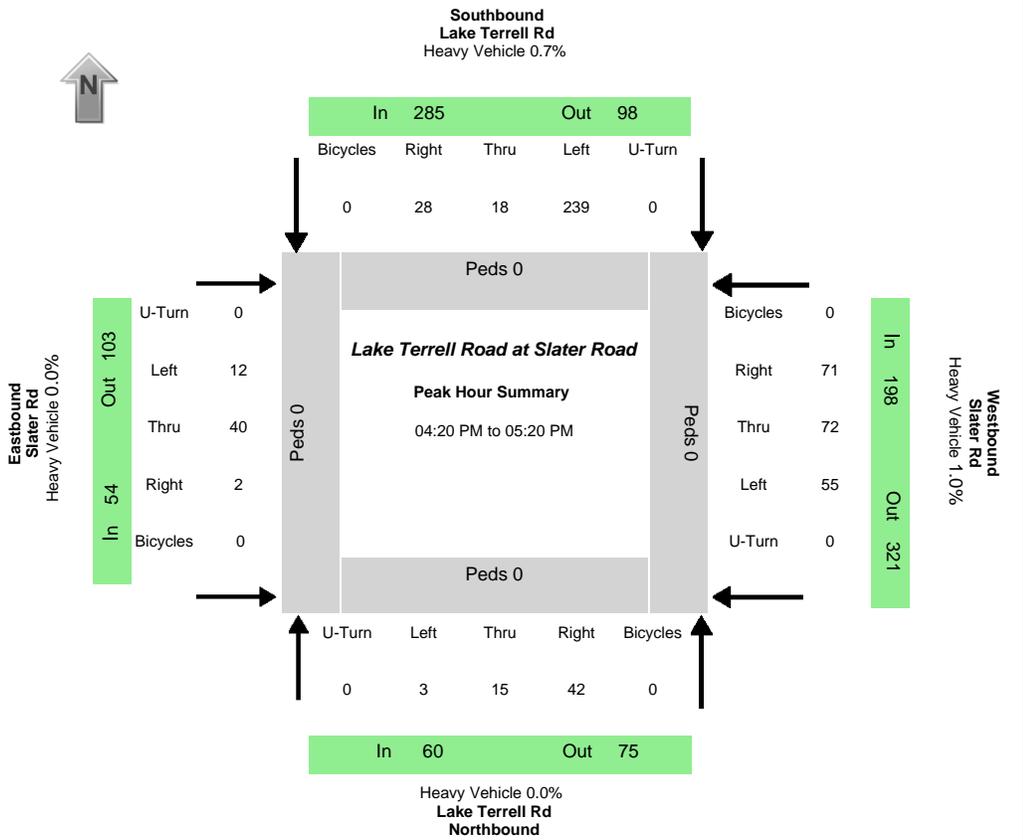
1			2			3			4			5			6					
42	27	355	106	18	6	3	10	21	52	37	205	177	174	122	0	0	0	217	704	0
↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
18	59	3	168	7	202	1	449	76	30	999	15	0	489	813	0	0	0	152	459	0
↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑
4	22	62	143	7	0	86	73	431	28	24	98	0	0	0	526	6	305			



KEY DATA NETWORK

Data Provided by K-D-N.com 503-594-4224

N/S street	Lake Terrell Rd
E/W street	Slater Rd
City, State	Ferndale WA
Site Notes	
Location	48.819449 - -122.682684
Start Date	Wednesday, July 10, 2019
Start Time	04:00:00 PM
Weather	
Study ID #	
Peak Hour Start	04:20:00 PM
Peak 15 Min Start	05:00:00 PM
PHF (15-Min Int)	0.87



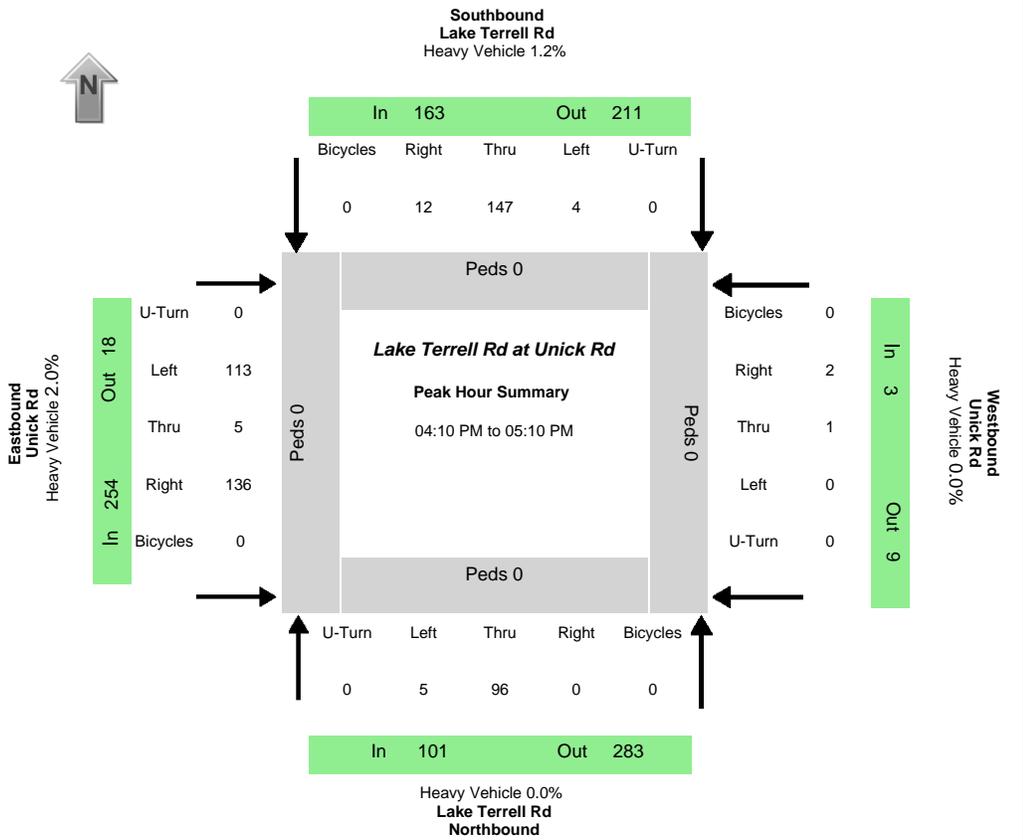
Peak-Hour Volumes (PHV)																							
Northbound				Southbound				Eastbound				Westbound				Entering				Leaving			
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	NB	SB	EB	WB	NB	SB	EB	WB
3	15	42	0	239	18	28	0	12	40	2	0	55	72	71	0	60	285	54	198	75	98	103	321
Percent Heavy Vehicles																							
0.0%	0.0%	0.0%	0.0%	0.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.8%	1.4%	0.0%	0.0%	0.0%	0.7%	0.0%	1.0%	1.3%	0.0%	1.0%	0.6%

PHV - Bicycles														PHV - Pedestrians							
Northbound				Southbound				Eastbound				Westbound				in Crosswalk					
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Sum	NB	SB	EB	WB	Sum
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Time	Northbound Lake Terrell Rd				Southbound Lake Terrell Rd				Eastbound Slater Rd				Westbound Slater Rd				15 Min Sum	1 HR Sum	
	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn			
04:00:00 PM	1	0	3	0	12	2	0	0	0	7	1	0	0	0	7	1	0		
04:05:00 PM	0	1	3	0	36	2	3	0	0	1	0	0	0	6	5	1	0		
04:10:00 PM	0	0	5	0	19	0	1	0	0	2	9	0	0	7	9	2	0	146	
04:15:00 PM	0	1	2	0	16	1	3	0	0	2	8	1	0	3	5	3	0	157	
04:20:00 PM	0	1	7	0	13	1	6	0	0	1	4	0	0	3	5	5	0	145	
04:25:00 PM	0	2	3	0	14	3	1	0	0	0	4	0	0	1	7	2	0	128	
04:30:00 PM	0	2	3	0	20	1	3	0	0	2	4	0	0	3	5	10	0	136	
04:35:00 PM	0	0	4	0	28	1	3	0	0	3	1	0	0	3	3	9	0	145	
04:40:00 PM	0	2	0	0	19	2	0	0	0	1	2	0	0	5	4	6	0	149	
04:45:00 PM	1	0	1	0	11	2	2	0	0	2	4	0	0	5	5	8	0	137	
04:50:00 PM	0	2	4	0	16	1	4	0	0	0	4	0	0	6	8	5	0	132	
04:55:00 PM	1	2	3	0	19	1	3	0	0	1	4	1	0	4	10	2	0	142	565
05:00:00 PM	0	2	6	0	15	1	0	0	0	0	1	0	0	10	8	8	0	152	582
05:05:00 PM	0	0	2	0	47	1	4	0	0	1	4	0	0	0	4	5	0	170	592
05:10:00 PM	0	1	2	0	24	2	1	0	0	0	4	1	0	7	6	5	0	172	591
05:15:00 PM	1	1	7	0	13	2	1	0	0	1	4	0	0	8	7	6	0	172	597
05:20:00 PM	0	0	2	0	7	1	1	0	0	4	3	0	0	5	7	3	0	137	584
05:25:00 PM	1	1	2	0	13	5	3	0	0	2	6	0	0	2	7	5	0	131	594
05:30:00 PM	0	2	0	0	11	2	3	0	0	1	6	0	0	5	6	6	0	122	583
05:35:00 PM	0	2	2	0	8	1	3	0	0	3	8	0	0	4	9	8	0	137	576
05:40:00 PM	1	4	5	0	9	2	3	0	0	0	2	0	0	9	8	7	0	140	585
05:45:00 PM	0	0	3	0	7	0	4	0	0	2	7	1	0	7	8	4	0	141	587
05:50:00 PM	0	1	4	0	6	1	0	0	0	1	7	0	0	6	13	0	0	132	576
05:55:00 PM	0	1	1	0	9	1	1	0	0	2	2	1	0	5	15	2	0	122	565

Data Provided by K-D-N.com 503-594-4224

N/S street	Lake Terrell Rd
E/W street	Unick Rd
City, State	Ferndale WA
Site Notes	
Location	48.833882 - -122.682392
Start Date	Wednesday, July 10, 2019
Start Time	04:00:00 PM
Weather	
Study ID #	
Peak Hour Start	04:10:00 PM
Peak 15 Min Start	04:55:00 PM
PHF (15-Min Int)	0.80



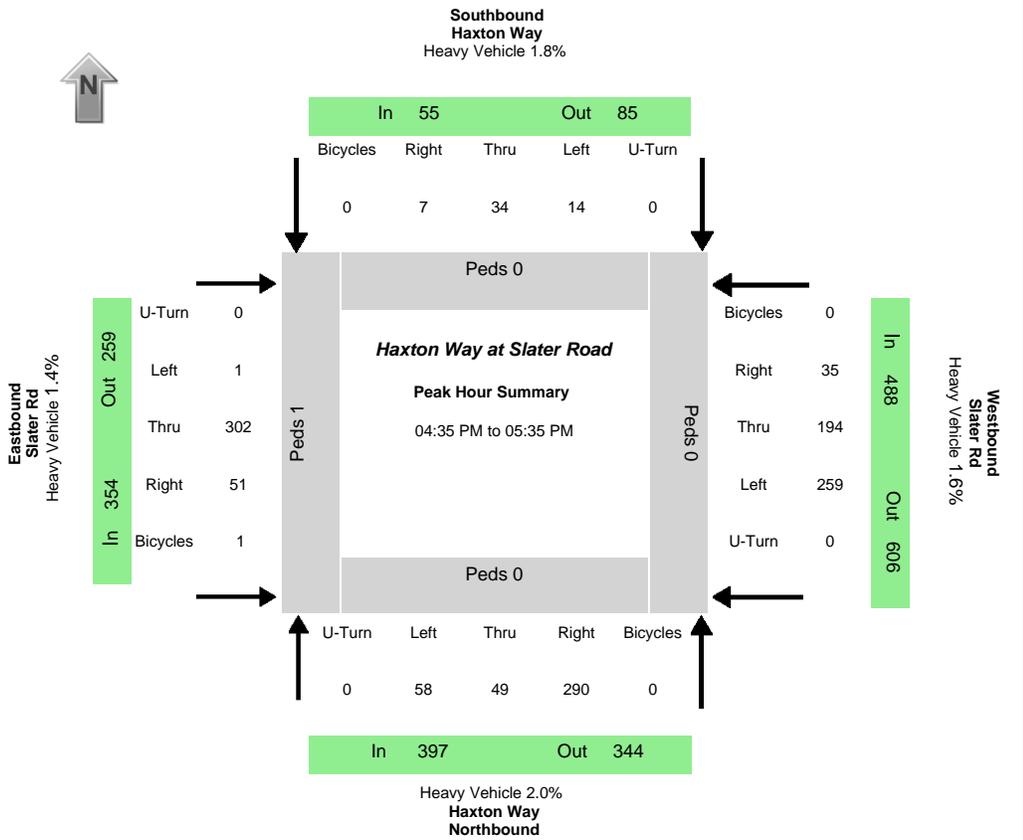
Peak-Hour Volumes (PHV)																							
Northbound				Southbound				Eastbound				Westbound				Entering				Leaving			
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	NB	SB	EB	WB	NB	SB	EB	WB
5	96	0	0	4	147	12	0	113	5	136	0	0	1	2	0	101	163	254	3	283	211	18	9
Percent Heavy Vehicles																							
0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	16.7%	0.0%	2.7%	0.0%	1.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.2%	2.0%	0.0%	0.7%	1.4%	11.1%	0.0%

PHV - Bicycles														PHV - Pedestrians							
Northbound				Southbound				Eastbound				Westbound				in Crosswalk					
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Sum	NB	SB	EB	WB	Sum
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Time	Northbound Lake Terrell Rd				Southbound Lake Terrell Rd				Eastbound Unick Rd				Westbound Unick Rd				15 Min Sum	1 HR Sum
	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn		
04:00:00 PM	2	4	0	0	1	6	1	0	11	3	15	0	1	0	0	0		
04:05:00 PM	3	4	0	0	1	11	3	0	13	7	25	0	0	1	1	0		
04:10:00 PM	1	6	0	0	0	4	2	0	17	0	17	0	0	0	0	0	160	
04:15:00 PM	1	4	0	0	1	14	4	0	12	2	8	0	0	0	0	0	162	
04:20:00 PM	1	9	0	0	0	11	4	0	6	1	5	0	0	0	0	0	130	
04:25:00 PM	1	6	0	0	0	17	0	0	7	0	7	0	0	0	0	0	121	
04:30:00 PM	0	7	0	0	1	8	0	0	7	0	20	0	0	0	0	0	118	
04:35:00 PM	0	17	0	0	2	20	1	0	5	1	8	0	0	0	0	0	135	
04:40:00 PM	0	6	0	0	0	7	0	0	2	0	4	0	0	0	0	0	116	
04:45:00 PM	0	13	0	0	0	12	0	0	4	0	4	0	0	0	1	0	107	
04:50:00 PM	0	6	0	0	0	23	0	0	8	0	3	0	0	0	1	0	94	
04:55:00 PM	0	6	0	0	0	2	0	0	4	0	11	0	0	0	0	0	98	495
05:00:00 PM	1	8	0	0	0	13	0	0	16	0	21	0	0	1	0	0	124	511
05:05:00 PM	0	8	0	0	0	16	1	0	25	1	28	0	0	0	0	0	162	521
05:10:00 PM	0	9	0	0	3	14	2	0	4	2	8	0	0	0	0	0	181	516
05:15:00 PM	0	6	0	0	1	8	1	0	5	0	4	0	0	0	0	0	146	495
05:20:00 PM	0	8	0	0	1	11	0	0	5	0	3	0	0	0	0	0	95	486
05:25:00 PM	0	10	0	0	0	17	0	0	1	0	3	0	0	0	1	0	85	480
05:30:00 PM	0	10	1	0	2	11	0	0	3	1	5	0	1	0	0	0	94	471
05:35:00 PM	1	12	0	0	0	5	0	0	1	0	6	0	0	0	0	0	91	442
05:40:00 PM	3	3	0	0	1	6	1	0	5	0	7	0	1	0	0	0	86	450
05:45:00 PM	0	10	0	0	0	7	0	0	8	0	3	0	0	0	0	0	80	444
05:50:00 PM	0	3	1	0	0	6	0	0	2	0	1	0	0	0	0	0	68	416
05:55:00 PM	0	5	0	0	1	5	0	0	3	0	4	0	1	0	0	0	60	412

Data Provided by K-D-N.com 503-594-4224

N/S street	Haxton Way
E/W street	Slater Rd
City, State	Ferndale WA
Site Notes	
Location	48.819303 - -122.62785
Start Date	Wednesday, July 10, 2019
Start Time	04:00:00 PM
Weather	
Study ID #	
Peak Hour Start	04:35:00 PM
Peak 15 Min Start	04:35:00 PM
PHF (15-Min Int)	0.90



Peak-Hour Volumes (PHV)

Northbound				Southbound				Eastbound				Westbound				Entering				Leaving			
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	NB	SB	EB	WB	NB	SB	EB	WB
58	49	290	0	14	34	7	0	1	302	51	0	259	194	35	0	397	55	354	488	344	85	259	606
Percent Heavy Vehicles																							
0.0%	6.1%	1.7%	0.0%	7.1%	0.0%	0.0%	0.0%	0.0%	1.3%	2.0%	0.0%	1.5%	2.1%	0.0%	0.0%	2.0%	1.8%	1.4%	1.6%	1.5%	3.5%	1.5%	1.7%

PHV - Bicycles

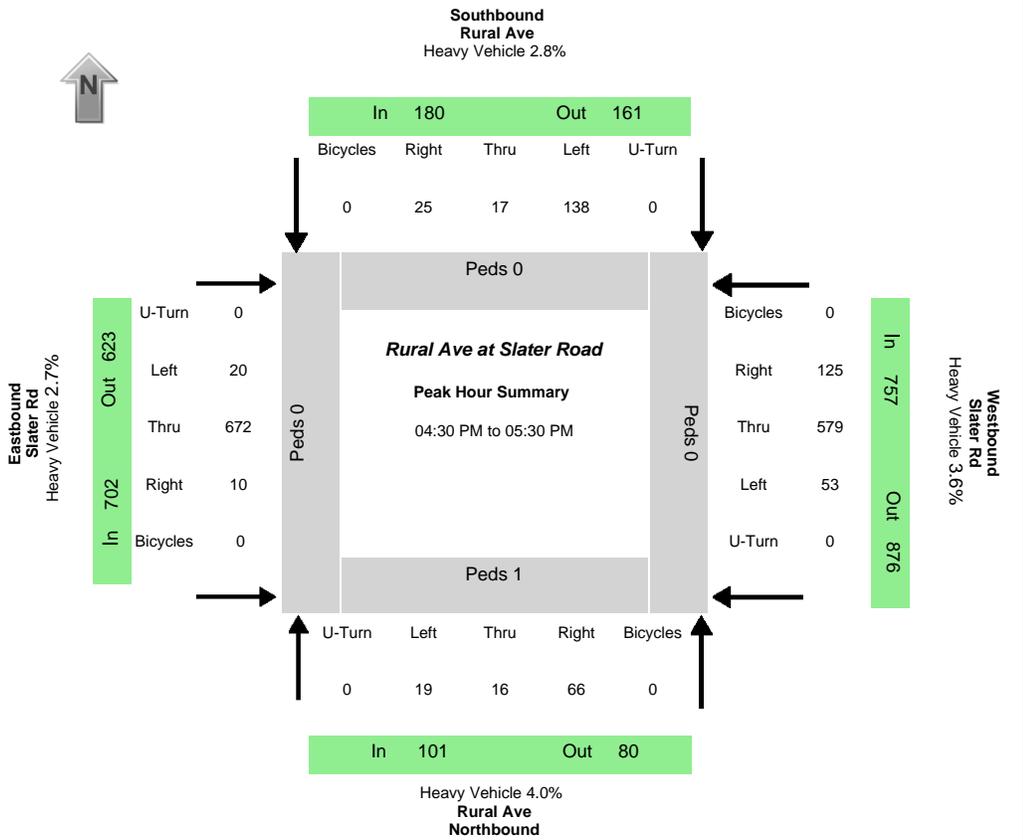
PHV - Bicycles																PHV - Pedestrians					
Northbound				Southbound				Eastbound				Westbound				Sum	in Crosswalk				Sum
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn		NB	SB	EB	WB	
0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	1

All Vehicle Volumes

Time	Northbound Haxton Way				Southbound Haxton Way				Eastbound Slater Rd				Westbound Slater Rd				15 Min Sum	1 HR Sum
	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn		
04:00:00 PM	7	4	24	0	1	4	0	0	1	17	3	0	19	12	0	0		
04:05:00 PM	8	3	33	0	0	3	0	0	1	32	5	0	11	18	2	0		
04:10:00 PM	3	9	20	0	5	2	0	0	0	45	3	0	17	8	2	0	322	
04:15:00 PM	4	2	32	0	2	2	0	0	0	32	7	0	12	17	2	0	342	
04:20:00 PM	2	1	16	0	1	1	0	0	0	25	3	0	25	15	2	0	317	
04:25:00 PM	2	5	15	0	1	3	0	0	0	28	2	0	16	10	1	0	286	
04:30:00 PM	5	2	18	0	1	2	0	0	0	23	3	0	16	19	3	0	266	
04:35:00 PM	6	4	39	0	0	1	1	0	0	39	3	0	19	10	4	0	301	
04:40:00 PM	6	8	29	0	0	4	0	0	0	31	5	0	28	20	1	0	350	
04:45:00 PM	5	3	29	0	2	4	0	0	0	22	0	0	20	15	1	0	359	
04:50:00 PM	10	8	26	0	0	5	1	0	0	17	3	0	23	17	2	0	345	
04:55:00 PM	2	0	19	0	0	2	1	0	0	19	8	0	21	21	2	0	308	1266
05:00:00 PM	3	4	21	0	0	3	0	0	0	23	3	0	10	10	4	0	288	1255
05:05:00 PM	9	5	25	0	2	1	2	0	1	30	6	0	16	13	4	0	290	1253
05:10:00 PM	2	2	21	0	1	2	1	0	0	48	7	0	22	22	1	0	324	1268
05:15:00 PM	1	5	22	0	4	4	0	0	0	22	2	0	34	17	4	0	358	1271
05:20:00 PM	2	3	12	0	2	2	0	0	0	18	4	0	24	17	4	0	332	1268
05:25:00 PM	7	6	28	0	3	1	0	0	0	12	6	0	22	11	4	0	303	1285
05:30:00 PM	5	1	19	0	0	5	1	0	0	21	4	0	20	21	4	0	289	1294
05:35:00 PM	6	3	22	0	1	3	0	0	0	11	6	0	19	17	3	0	292	1259
05:40:00 PM	3	6	14	0	2	1	1	0	0	19	3	0	14	18	2	0	275	1210
05:45:00 PM	3	2	18	0	1	2	2	0	1	20	5	0	20	24	2	0	274	1209
05:50:00 PM	7	1	20	0	3	4	0	0	0	17	1	0	24	23	1	0	284	1198
05:55:00 PM	2	3	17	0	0	2	0	0	0	18	3	0	15	14	2	0	277	1179

Data Provided by K-D-N.com 503-594-4224

N/S street	Rural Ave
E/W street	Slater Rd
City, State	Ferndale WA
Site Notes	
Location	48.817341 - -122.554652
Start Date	Wednesday, July 10, 2019
Start Time	04:00:00 PM
Weather	
Study ID #	
Peak Hour Start	04:30:00 PM
Peak 15 Min Start	04:40:00 PM
PHF (15-Min Int)	0.88



Peak-Hour Volumes (PHV)																							
Northbound				Southbound				Eastbound				Westbound				Entering				Leaving			
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	NB	SB	EB	WB	NB	SB	EB	WB
19	16	66	0	138	17	25	0	20	672	10	0	53	579	125	0	101	180	702	757	80	161	623	876
Percent Heavy Vehicles																							
5.3%	0.0%	4.5%	0.0%	2.9%	0.0%	4.0%	0.0%	5.0%	2.7%	0.0%	0.0%	7.5%	3.3%	3.2%	0.0%	4.0%	2.8%	2.7%	3.6%	5.0%	3.1%	3.4%	2.9%

PHV - Bicycles														PHV - Pedestrians							
Northbound				Southbound				Eastbound				Westbound				in Crosswalk					
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Sum	NB	SB	EB	WB	Sum
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1

Time	Northbound Rural Ave				Southbound Rural Ave				Eastbound Slater Rd				Westbound Slater Rd				15 Min Sum	1 HR Sum
	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn		
04:00:00 PM	2	1	2	0	12	1	2	0	2	43	0	0	7	33	5	0		
04:05:00 PM	1	1	4	0	14	0	1	0	2	58	0	0	2	38	9	0		
04:10:00 PM	3	4	3	0	12	1	3	0	2	60	1	0	4	35	8	0	376	
04:15:00 PM	3	5	5	0	9	1	1	0	3	68	1	0	3	39	6	0	410	
04:20:00 PM	2	2	4	0	8	1	2	0	1	58	2	0	7	47	6	0	420	
04:25:00 PM	3	0	7	0	7	3	1	0	1	39	1	0	1	47	10	0	404	
04:30:00 PM	1	2	5	0	11	0	0	0	1	58	1	0	4	51	9	0	403	
04:35:00 PM	3	2	10	0	16	1	2	0	1	52	1	0	3	51	12	0	417	
04:40:00 PM	4	2	7	0	13	1	2	0	1	78	1	0	4	40	14	0	464	
04:45:00 PM	3	2	6	0	12	1	4	0	5	67	1	0	4	47	12	0	485	
04:50:00 PM	1	1	13	0	16	3	3	0	2	50	0	0	8	53	12	0	493	
04:55:00 PM	0	3	4	0	18	1	1	0	1	49	0	0	3	36	11	0	453	1697
05:00:00 PM	1	0	3	0	14	3	0	0	1	49	0	0	4	39	6	0	409	1707
05:05:00 PM	3	0	2	0	4	1	2	0	2	47	1	0	8	49	8	0	374	1704
05:10:00 PM	0	0	3	0	13	2	0	0	2	62	1	0	4	57	8	0	399	1720
05:15:00 PM	2	4	5	0	7	0	4	0	2	70	1	0	0	52	10	0	436	1733
05:20:00 PM	1	0	3	0	8	0	3	0	2	52	3	0	8	49	13	0	451	1735
05:25:00 PM	0	0	5	0	6	4	4	0	0	38	0	0	3	55	10	0	424	1740
05:30:00 PM	1	2	2	0	11	3	4	0	0	40	0	0	5	40	8	0	383	1713
05:35:00 PM	1	1	4	0	9	3	2	0	2	43	3	0	4	54	2	0	369	1687
05:40:00 PM	0	0	5	0	6	0	1	0	3	32	0	0	4	56	14	0	365	1641
05:45:00 PM	0	5	2	0	9	0	5	0	1	37	0	0	3	42	5	0	358	1586
05:50:00 PM	0	2	3	0	7	1	1	0	1	33	0	0	4	42	2	0	326	1520
05:55:00 PM	0	1	3	0	9	1	1	0	1	60	2	0	6	32	7	0	328	1516

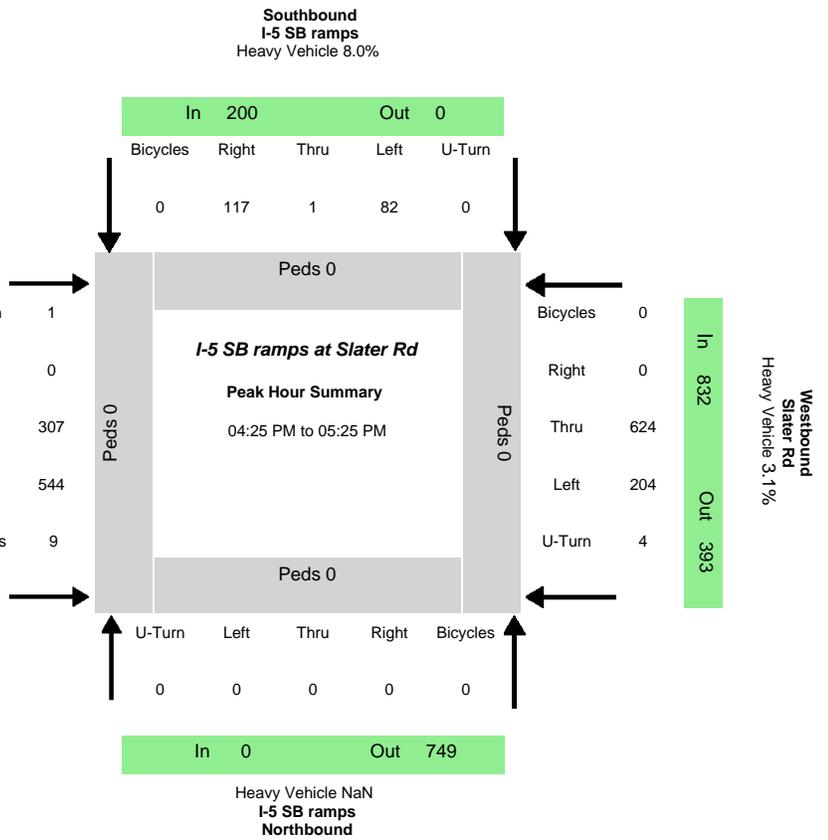
Data Provided by K-D-N.com 503-594-4224

N/S street	I-5 SB ramps
E/W street	Slater Rd
City, State	Ferndale WA
Site Notes	
Location	48.817118 - -122.550559
Start Date	Wednesday, July 10, 2019
Start Time	04:00:00 PM
Weather	
Study ID #	
Peak Hour Start	04:25:00 PM
Peak 15 Min Start	04:40:00 PM
PHF (15-Min Int)	0.90

Eastbound
Slater Rd
Heavy Vehicle 2.3%



Out 742
In 852



Peak-Hour Volumes (PHV)

Northbound				Southbound				Eastbound				Westbound				Entering				Leaving			
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	NB	SB	EB	WB	NB	SB	EB	WB
0	0	0	0	82	1	117	0	0	307	544	1	204	624	0	4	0	200	852	832	749	0	742	393
0.0%				9.8%				0.0%				2.9%				NaN				2.0%			
0.0%				0.0%				3.6%				0.0%				8.0%				0.0%			
0.0%				6.8%				1.7%				0.0%				2.3%				3.8%			
0.0%				0.0%				0.0%				0.0%				0.0%				4.8%			

PHV - Bicycles

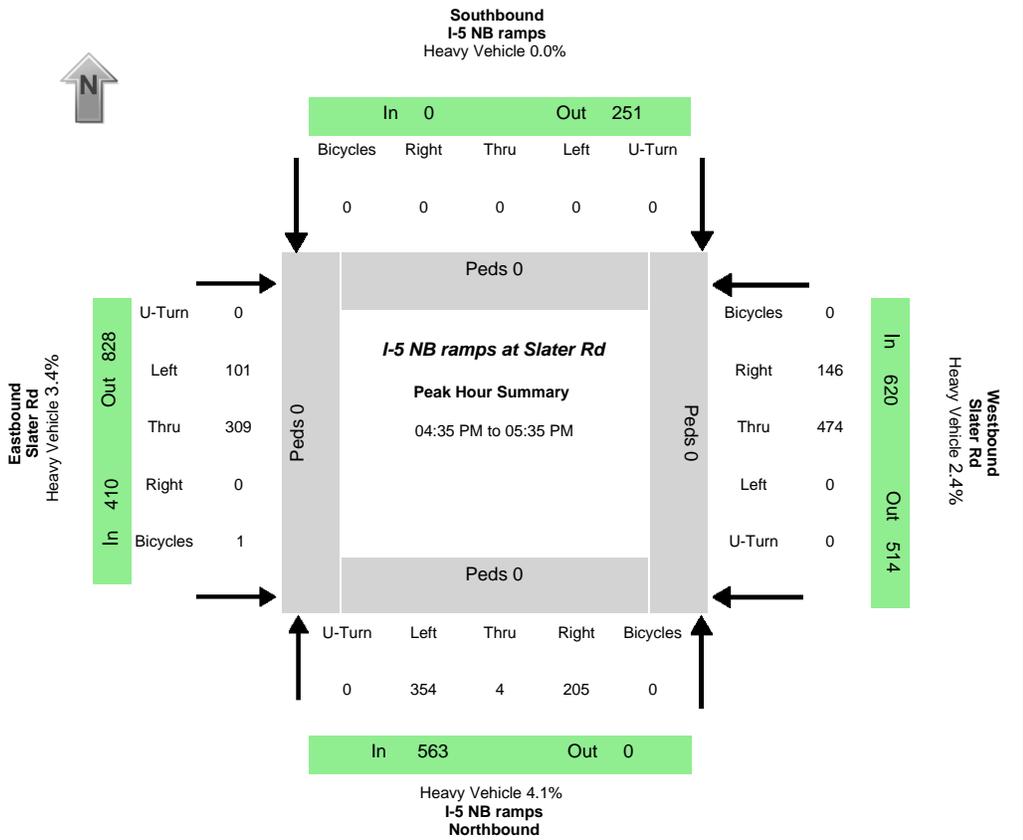
PHV - Bicycles												PHV - Pedestrians									
Northbound				Southbound				Eastbound				Westbound				in Crosswalk					
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Sum	NB	SB	EB	WB	Sum
0	0	0	0	0	0	0	0	0	0	9	0	0	0	0	0	9	0	0	0	0	0

All Vehicle Volumes

Time	Northbound I-5 SB ramps				Southbound I-5 SB ramps				Eastbound Slater Rd				Westbound Slater Rd				15 Min Sum	1 HR Sum
	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn		
04:00:00 PM	0	0	0	0	10	2	4	0	0	21	38	0	15	43	0	0		
04:05:00 PM	0	0	0	0	3	0	2	0	0	30	34	0	15	44	0	0		
04:10:00 PM	0	0	0	0	4	0	9	0	0	24	49	0	25	42	0	1	415	
04:15:00 PM	0	0	0	0	4	0	7	0	0	20	56	0	13	42	0	0	424	
04:20:00 PM	0	0	0	0	6	0	7	0	0	28	47	0	7	48	0	0	439	
04:25:00 PM	0	0	0	0	5	0	7	0	0	17	40	0	15	54	0	0	423	
04:30:00 PM	0	0	0	0	5	0	16	0	0	22	39	0	17	41	0	1	422	
04:35:00 PM	0	0	0	0	7	0	8	0	0	33	40	0	28	57	0	1	453	
04:40:00 PM	0	0	0	0	8	0	13	0	0	30	67	0	18	46	0	0	497	
04:45:00 PM	0	0	0	0	6	1	8	0	0	28	47	0	15	54	0	0	515	
04:50:00 PM	0	0	0	0	7	0	13	0	0	36	47	1	14	63	0	0	522	
04:55:00 PM	0	0	0	0	10	0	10	0	0	24	45	0	13	42	0	0	484	1819
05:00:00 PM	0	0	0	0	8	0	6	0	0	18	45	0	12	40	0	0	454	1815
05:05:00 PM	0	0	0	0	5	0	6	0	0	26	32	0	19	54	0	0	415	1829
05:10:00 PM	0	0	0	0	6	0	15	0	0	21	47	0	24	54	0	1	439	1843
05:15:00 PM	0	0	0	0	8	0	6	0	0	22	50	0	17	62	0	1	476	1867
05:20:00 PM	0	0	0	0	7	0	9	0	0	30	45	0	12	57	0	0	494	1884
05:25:00 PM	0	0	1	0	6	0	7	0	0	21	28	0	7	56	0	0	452	1872
05:30:00 PM	0	0	0	0	10	0	10	0	0	20	20	0	14	47	0	2	409	1854
05:35:00 PM	0	0	0	0	7	0	8	0	0	24	40	0	7	51	0	1	387	1818
05:40:00 PM	0	0	0	0	9	0	7	0	0	16	30	0	13	58	0	0	394	1769
05:45:00 PM	0	0	0	0	3	1	5	0	0	26	20	0	10	54	0	1	391	1730
05:50:00 PM	0	0	0	0	3	0	6	0	0	14	20	0	8	41	0	0	345	1641
05:55:00 PM	0	0	0	0	7	0	5	0	0	26	52	0	5	36	0	0	343	1628

Data Provided by K-D-N.com 503-594-4224

N/S street	I-5 NB ramps
E/W street	Slater Rd
City, State	Ferndale WA
Site Notes	
Location	48.817338 - -122.545967
Start Date	Wednesday, July 10, 2019
Start Time	04:00:00 PM
Weather	
Study ID #	
Peak Hour Start	04:35:00 PM
Peak 15 Min Start	04:35:00 PM
PHF (15-Min Int)	0.93



Peak-Hour Volumes (PHV)																							
Northbound				Southbound				Eastbound				Westbound				Entering				Leaving			
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	NB	SB	EB	WB	NB	SB	EB	WB
354	4	205	0	0	0	0	0	101	309	0	0	0	474	146	0	563	0	410	620	0	251	828	514
Percent Heavy Vehicles																							
2.8%	0.0%	6.3%	0.0%	0.0%	0.0%	0.0%	0.0%	3.0%	3.6%	0.0%	0.0%	0.0%	2.3%	2.7%	0.0%	4.1%	0.0%	3.4%	2.4%	NaN	2.8%	2.5%	4.7%

PHV - Bicycles														PHV - Pedestrians							
Northbound				Southbound				Eastbound				Westbound				in Crosswalk					
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Sum	NB	SB	EB	WB	Sum
0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0

Time	Northbound I-5 NB ramps				Southbound I-5 NB ramps				Eastbound Slater Rd				Westbound Slater Rd				15 Min Sum	1 HR Sum	
	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn			
04:00:00 PM	22	1	8	0	0	0	0	0	4	27	0	0	0	36	9	0	0	355	
04:05:00 PM	24	0	17	0	0	0	0	0	11	21	0	0	0	31	8	0	0	354	
04:10:00 PM	29	0	17	0	0	0	0	0	5	26	0	0	0	41	18	0	0	354	
04:15:00 PM	26	1	16	0	0	0	0	0	5	20	0	0	0	27	10	1	0	360	
04:20:00 PM	29	0	21	0	0	0	0	0	6	27	0	0	0	29	6	0	0	345	
04:25:00 PM	33	1	22	0	1	0	0	0	3	21	0	0	0	33	7	0	0	349	
04:30:00 PM	22	2	14	0	0	0	0	0	7	20	0	0	0	37	8	0	0	390	
04:35:00 PM	32	0	17	0	0	0	0	0	9	30	0	0	0	58	13	0	0	395	
04:40:00 PM	26	1	18	0	0	0	0	0	10	28	0	0	0	35	8	0	0	427	
04:45:00 PM	30	0	16	0	0	0	0	0	12	26	0	0	0	41	17	0	0	416	
04:50:00 PM	40	1	13	0	0	0	0	0	11	34	0	0	0	33	16	0	0	409	1504
04:55:00 PM	23	0	16	0	0	0	0	0	12	24	0	0	0	31	13	0	0	380	1510
05:00:00 PM	22	1	15	0	0	0	0	0	7	23	0	0	0	34	11	0	0	374	1540
05:05:00 PM	27	0	20	0	0	0	0	0	2	26	0	0	0	52	15	0	0	395	1544
05:10:00 PM	32	0	25	0	0	0	0	0	7	22	0	0	0	45	9	0	0	422	1578
05:15:00 PM	29	0	21	0	0	0	0	0	9	21	0	0	0	42	18	0	0	406	1586
05:20:00 PM	29	1	14	0	0	0	0	0	6	28	0	0	0	41	7	0	0	388	1587
05:25:00 PM	37	0	18	0	0	0	0	0	5	25	0	0	0	26	11	0	0	364	1593
05:30:00 PM	27	0	12	0	0	0	0	0	11	22	0	0	0	36	8	0	0	355	1551
05:35:00 PM	32	0	16	0	0	0	0	0	1	31	0	0	0	29	8	0	0	353	1545
05:40:00 PM	35	1	16	0	0	0	0	0	4	21	0	0	0	39	3	1	0	353	1519
05:45:00 PM	31	0	12	0	0	0	0	0	9	21	0	0	0	31	12	0	0	329	1464
05:50:00 PM	17	0	16	0	0	0	0	0	7	14	0	0	0	26	13	0	0	311	1447
05:55:00 PM	22	0	20	0	0	0	0	0	9	22	0	0	0	25	4	0	0		

Appendix C. Traffic Analysis Results

HCM 6th AWSC
1: Lake Terrell Rd & Slater Rd

Intersection	
Intersection Delay, s/veh	10
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	12	40	2	55	72	0	3	15	42	239	18	28
Future Vol, veh/h	12	40	2	55	72	0	3	15	42	239	18	28
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Heavy Vehicles, %	0	0	0	1	1	1	0	0	0	1	1	1
Mvmt Flow	14	46	2	63	83	0	3	17	48	275	21	32
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8.6	9.4	7.9	11
HCM LOS	A	A	A	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	5%	22%	43%	84%
Vol Thru, %	25%	74%	57%	6%
Vol Right, %	70%	4%	0%	10%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	60	54	127	285
LT Vol	3	12	55	239
Through Vol	15	40	72	18
RT Vol	42	2	0	28
Lane Flow Rate	69	62	146	328
Geometry Grp	1	1	1	1
Degree of Util (X)	0.084	0.087	0.203	0.421
Departure Headway (Hd)	4.403	5.053	5.017	4.629
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	810	706	712	776
Service Time	2.453	3.109	3.065	2.665
HCM Lane V/C Ratio	0.085	0.088	0.205	0.423
HCM Control Delay	7.9	8.6	9.4	11
HCM Lane LOS	A	A	A	B
HCM 95th-tile Q	0.3	0.3	0.8	2.1

HCM 6th AWSC
2: Lake Terrell Rd & Unick Rd

Intersection	
Intersection Delay, s/veh	9.9
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	113	5	136	0	1	2	5	96	0	4	147	12
Future Vol, veh/h	113	5	136	0	1	2	5	96	0	4	147	12
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Heavy Vehicles, %	2	2	2	0	0	0	0	0	0	1	1	1
Mvmt Flow	141	6	170	0	1	3	6	120	0	5	184	15
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	10.5	7.8	9	9.6
HCM LOS	B	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	5%	44%	0%	2%
Vol Thru, %	95%	2%	33%	90%
Vol Right, %	0%	54%	67%	7%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	101	254	3	163
LT Vol	5	113	0	4
Through Vol	96	5	1	147
RT Vol	0	136	2	12
Lane Flow Rate	126	318	4	204
Geometry Grp	1	1	1	1
Degree of Util (X)	0.172	0.397	0.005	0.271
Departure Headway (Hd)	4.913	4.5	4.687	4.786
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	726	797	757	748
Service Time	2.97	2.542	2.756	2.838
HCM Lane V/C Ratio	0.174	0.399	0.005	0.273
HCM Control Delay	9	10.5	7.8	9.6
HCM Lane LOS	A	B	A	A
HCM 95th-tile Q	0.6	1.9	0	1.1

HCM 6th Signalized Intersection Summary 3: Haxton Way & Slater Rd

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	302	51	259	194	35	58	49	290	14	34	7
Future Volume (veh/h)	1	302	51	259	194	35	58	49	290	14	34	7
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	1	336	57	288	216	39	64	54	322	16	38	8
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	585	761	129	474	753	136	369	284	555	179	388	72
Arrive On Green	0.49	0.49	0.49	0.49	0.49	0.49	0.35	0.35	0.35	0.35	0.35	0.35
Sat Flow, veh/h	1125	1558	264	991	1542	278	770	811	1585	280	1108	206
Grp Volume(v), veh/h	1	0	393	288	0	255	118	0	322	62	0	0
Grp Sat Flow(s),veh/h/ln	1125	0	1823	991	0	1820	1581	0	1585	1593	0	0
Q Serve(g_s), s	0.0	0.0	7.8	14.9	0.0	4.6	0.9	0.0	9.2	0.0	0.0	0.0
Cycle Q Clear(g_c), s	4.7	0.0	7.8	22.7	0.0	4.6	2.6	0.0	9.2	1.3	0.0	0.0
Prop In Lane	1.00		0.15	1.00		0.15	0.54		1.00	0.26		0.13
Lane Grp Cap(c), veh/h	585	0	890	474	0	889	653	0	555	639	0	0
V/C Ratio(X)	0.00	0.00	0.44	0.61	0.00	0.29	0.18	0.00	0.58	0.10	0.00	0.00
Avail Cap(c_a), veh/h	873	0	1358	728	0	1356	653	0	555	639	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	9.9	0.0	9.3	16.7	0.0	8.5	12.6	0.0	14.8	12.2	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.3	1.3	0.0	0.2	0.6	0.0	4.4	0.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	2.1	2.7	0.0	1.3	1.0	0.0	3.5	0.5	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	9.9	0.0	9.6	18.0	0.0	8.7	13.2	0.0	19.2	12.5	0.0	0.0
LnGrp LOS	A	A	A	B	A	A	B	A	B	B	A	A
Approach Vol, veh/h		394			543			440			62	
Approach Delay, s/veh		9.6			13.6			17.6			12.5	
Approach LOS		A			B			B			B	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		31.7		24.0		31.7		24.0				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		41.5		19.5		41.5		19.5				
Max Q Clear Time (g_c+I1), s		9.8		3.3		24.7		11.2				
Green Ext Time (p_c), s		2.2		0.2		2.5		1.2				
Intersection Summary												
HCM 6th Ctrl Delay				13.7								
HCM 6th LOS				B								

HCM 6th Signalized Intersection Summary

4: Rural Ave & Slater Rd

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	672	10	53	569	119	19	16	66	138	17	25
Future Volume (veh/h)	20	672	10	53	569	119	19	16	66	138	17	25
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1841	1841	1841	1841	1841	1841	1856	1856	1856
Adj Flow Rate, veh/h	23	764	11	60	647	135	22	18	75	157	19	28
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	3	3	3	4	4	4	4	4	4	3	3	3
Cap, veh/h	449	1143	16	417	1192	1010	268	288	244	282	106	156
Arrive On Green	0.03	0.63	0.63	0.05	0.65	0.65	0.16	0.16	0.16	0.16	0.16	0.16
Sat Flow, veh/h	1767	1825	26	1753	1841	1560	1337	1841	1560	1293	677	998
Grp Volume(v), veh/h	23	0	775	60	647	135	22	18	75	157	0	47
Grp Sat Flow(s),veh/h/ln	1767	0	1851	1753	1841	1560	1337	1841	1560	1293	0	1676
Q Serve(g_s), s	0.4	0.0	21.3	0.9	15.1	2.6	1.1	0.7	3.4	9.3	0.0	1.9
Cycle Q Clear(g_c), s	0.4	0.0	21.3	0.9	15.1	2.6	3.1	0.7	3.4	10.0	0.0	1.9
Prop In Lane	1.00		0.01	1.00		1.00	1.00		1.00	1.00		0.60
Lane Grp Cap(c), veh/h	449	0	1159	417	1192	1010	268	288	244	282	0	262
V/C Ratio(X)	0.05	0.00	0.67	0.14	0.54	0.13	0.08	0.06	0.31	0.56	0.00	0.18
Avail Cap(c_a), veh/h	572	0	1159	502	1192	1010	389	454	385	399	0	414
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	6.0	0.0	9.5	7.5	7.6	5.4	30.3	28.4	29.5	32.6	0.0	28.9
Incr Delay (d2), s/veh	0.0	0.0	3.1	0.2	1.8	0.3	0.1	0.1	0.7	1.7	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	7.8	0.3	5.2	0.8	0.4	0.3	1.3	2.9	0.0	0.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	6.1	0.0	12.5	7.7	9.3	5.6	30.4	28.5	30.2	34.3	0.0	29.3
LnGrp LOS	A	A	B	A	A	A	C	C	C	C	A	C
Approach Vol, veh/h		798			842			115			204	
Approach Delay, s/veh		12.4			8.6			30.0			33.2	
Approach LOS		B			A			C			C	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.2	54.0		16.9	6.5	55.7		16.9				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	7.5	49.5		19.5	7.5	49.5		19.5				
Max Q Clear Time (g_c+I1), s	2.9	23.3		12.0	2.4	17.1		5.4				
Green Ext Time (p_c), s	0.0	6.0		0.4	0.0	5.3		0.3				
Intersection Summary												
HCM 6th Ctrl Delay			14.0									
HCM 6th LOS			B									

HCM 6th Roundabout
 5: I-5 SB on ramp/I-5 SB off ramp & Slater Rd

Intersection				
Intersection Delay, s/veh	11.2			
Intersection LOS	B			
Approach	EB	WB	NB	SB
Entry Lanes	1	1	0	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	974	920	0	222
Demand Flow Rate, veh/h	993	948	0	239
Vehicles Circulating, veh/h	333	0	471	948
Vehicles Exiting, veh/h	854	471	235	0
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	9.6	11.8	0.0	15.7
Approach LOS	A	B	-	C
Lane	Left	Bypass	Left	Left
Designated Moves	T	R	LT	LTR
Assumed Moves	T	R	LT	LTR
RT Channelized	Yield			
Lane Util	1.000		1.000	1.000
Follow-Up Headway, s	2.609		2.609	2.609
Critical Headway, s	4.976	620	4.976	4.976
Entry Flow, veh/h	373	1086	948	239
Cap Entry Lane, veh/h	983	0.980	1380	525
Entry HV Adj Factor	0.980	608	0.971	0.929
Flow Entry, veh/h	366	1064	920	222
Cap Entry, veh/h	963	0.571	1339	487
V/C Ratio	0.380	10.6	0.687	0.455
Control Delay, s/veh	7.9	B	11.8	15.7
LOS	A	4	B	C
95th %tile Queue, veh	2		6	2

HCM 6th Roundabout
 6: I-5 NB off ramp/I-5 NB on ramp & Slater Rd

Intersection				
Intersection Delay, s/veh	12.9			
Intersection LOS	B			
Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	0
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	442	667	605	0
Demand Flow Rate, veh/h	455	680	629	0
Vehicles Circulating, veh/h	0	513	455	916
Vehicles Exiting, veh/h	916	571	0	117
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	5.6	12.6	18.4	0.0
Approach LOS	A	B	C	-
Lane	Left	Left	Bypass	Left
Designated Moves	LT	T	R	LTR
Assumed Moves	LT	T	R	LTR
RT Channelized			Yield	
Lane Util	1.000	1.000		1.000
Follow-Up Headway, s	2.609	2.609		2.609
Critical Headway, s	4.976	4.976	160	4.976
Entry Flow, veh/h	455	520	1225	629
Cap Entry Lane, veh/h	1380	818	0.980	868
Entry HV Adj Factor	0.972	0.980	157	0.962
Flow Entry, veh/h	442	510	1201	605
Cap Entry, veh/h	1341	802	0.131	834
V/C Ratio	0.330	0.636	4.1	0.725
Control Delay, s/veh	5.6	15.2	A	18.4
LOS	A	C	0	C
95th %tile Queue, veh	1	5		6

HCM 6th AWSC
1: Lake Terrell Rd & Slater Rd

Intersection	
Intersection Delay, s/veh	10.4
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	13	42	2	58	76	0	3	16	45	254	19	30
Future Vol, veh/h	13	42	2	58	76	0	3	16	45	254	19	30
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Heavy Vehicles, %	0	0	0	1	1	1	0	0	0	1	1	1
Mvmt Flow	15	48	2	67	87	0	3	18	52	292	22	34
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8.7	9.6	8	11.5
HCM LOS	A	A	A	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	5%	23%	43%	84%
Vol Thru, %	25%	74%	57%	6%
Vol Right, %	70%	4%	0%	10%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	64	57	134	303
LT Vol	3	13	58	254
Through Vol	16	42	76	19
RT Vol	45	2	0	30
Lane Flow Rate	74	66	154	348
Geometry Grp	1	1	1	1
Degree of Util (X)	0.091	0.093	0.218	0.452
Departure Headway (Hd)	4.466	5.137	5.088	4.669
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	797	693	702	770
Service Time	2.525	3.203	3.144	2.711
HCM Lane V/C Ratio	0.093	0.095	0.219	0.452
HCM Control Delay	8	8.7	9.6	11.5
HCM Lane LOS	A	A	A	B
HCM 95th-tile Q	0.3	0.3	0.8	2.4

HCM 6th AWSC
 2: Lake Terrell Rd & Unick Rd

Intersection	
Intersection Delay, s/veh	10.3
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	120	5	144	0	1	2	5	102	0	4	156	13
Future Vol, veh/h	120	5	144	0	1	2	5	102	0	4	156	13
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Heavy Vehicles, %	2	2	2	0	0	0	0	0	0	1	1	1
Mvmt Flow	150	6	180	0	1	3	6	128	0	5	195	16
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0
Approach	EB			WB			NB			SB		
Opposing Approach	WB			EB			SB			NB		
Opposing Lanes	1			1			1			1		
Conflicting Approach Left	SB			NB			EB			WB		
Conflicting Lanes Left	1			1			1			1		
Conflicting Approach Right	NB			SB			WB			EB		
Conflicting Lanes Right	1			1			1			1		
HCM Control Delay	11			7.9			9.2			9.9		
HCM LOS	B			A			A			A		

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	5%	45%	0%	2%
Vol Thru, %	95%	2%	33%	90%
Vol Right, %	0%	54%	67%	8%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	107	269	3	173
LT Vol	5	120	0	4
Through Vol	102	5	1	156
RT Vol	0	144	2	13
Lane Flow Rate	134	336	4	216
Geometry Grp	1	1	1	1
Degree of Util (X)	0.185	0.425	0.005	0.291
Departure Headway (Hd)	4.982	4.553	4.773	4.847
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	716	787	742	737
Service Time	3.048	2.602	2.855	2.907
HCM Lane V/C Ratio	0.187	0.427	0.005	0.293
HCM Control Delay	9.2	11	7.9	9.9
HCM Lane LOS	A	B	A	A
HCM 95th-tile Q	0.7	2.1	0	1.2

HCM 6th Signalized Intersection Summary 3: Haxton Way & Slater Rd

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	320	54	275	206	37	62	52	308	15	36	7
Future Volume (veh/h)	1	320	54	275	206	37	62	52	308	15	36	7
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	1	356	60	306	229	41	69	58	342	17	40	8
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	598	800	135	481	792	142	352	270	529	172	368	65
Arrive On Green	0.51	0.51	0.51	0.51	0.51	0.51	0.33	0.33	0.33	0.33	0.33	0.33
Sat Flow, veh/h	1109	1560	263	970	1544	276	770	809	1585	282	1105	195
Grp Volume(v), veh/h	1	0	416	306	0	270	127	0	342	65	0	0
Grp Sat Flow(s),veh/h/ln	1109	0	1823	970	0	1821	1579	0	1585	1581	0	0
Q Serve(g_s), s	0.0	0.0	8.4	17.0	0.0	5.0	1.4	0.0	10.7	0.0	0.0	0.0
Cycle Q Clear(g_c), s	5.0	0.0	8.4	25.4	0.0	5.0	3.1	0.0	10.7	1.4	0.0	0.0
Prop In Lane	1.00		0.14	1.00		0.15	0.54		1.00	0.26		0.12
Lane Grp Cap(c), veh/h	598	0	935	481	0	933	622	0	529	605	0	0
V/C Ratio(X)	0.00	0.00	0.45	0.64	0.00	0.29	0.20	0.00	0.65	0.11	0.00	0.00
Avail Cap(c_a), veh/h	816	0	1294	672	0	1292	622	0	529	605	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	9.6	0.0	9.0	17.0	0.0	8.2	14.0	0.0	16.6	13.5	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.3	1.4	0.0	0.2	0.7	0.0	6.0	0.4	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	2.3	3.1	0.0	1.3	1.2	0.0	4.2	0.6	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	9.6	0.0	9.3	18.4	0.0	8.3	14.7	0.0	22.6	13.8	0.0	0.0
LnGrp LOS	A	A	A	B	A	A	B	A	C	B	A	A
Approach Vol, veh/h		417			576			469			65	
Approach Delay, s/veh		9.3			13.7			20.5			13.8	
Approach LOS		A			B			C			B	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		34.5		24.0		34.5		24.0				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		41.5		19.5		41.5		19.5				
Max Q Clear Time (g_c+I1), s		10.4		3.4		27.4		12.7				
Green Ext Time (p_c), s		2.4		0.2		2.5		1.1				
Intersection Summary												
HCM 6th Ctrl Delay				14.6								
HCM 6th LOS				B								

HCM 6th Signalized Intersection Summary

4: Rural Ave & Slater Rd

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	21	713	11	56	604	126	20	17	70	146	18	27
Future Volume (veh/h)	21	713	11	56	604	126	20	17	70	146	18	27
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1841	1841	1841	1841	1841	1841	1856	1856	1856
Adj Flow Rate, veh/h	24	810	12	64	686	143	23	19	80	166	20	31
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	3	3	3	4	4	4	4	4	4	3	3	3
Cap, veh/h	417	1130	17	380	1180	1000	274	302	256	290	108	167
Arrive On Green	0.03	0.62	0.62	0.05	0.64	0.64	0.16	0.16	0.16	0.16	0.16	0.16
Sat Flow, veh/h	1767	1824	27	1753	1841	1560	1332	1841	1560	1286	656	1017
Grp Volume(v), veh/h	24	0	822	64	686	143	23	19	80	166	0	51
Grp Sat Flow(s),veh/h/ln	1767	0	1851	1753	1841	1560	1332	1841	1560	1286	0	1673
Q Serve(g_s), s	0.4	0.0	24.3	1.0	17.0	2.9	1.2	0.7	3.6	10.0	0.0	2.1
Cycle Q Clear(g_c), s	0.4	0.0	24.3	1.0	17.0	2.9	3.3	0.7	3.6	10.7	0.0	2.1
Prop In Lane	1.00		0.01	1.00		1.00	1.00		1.00	1.00		0.61
Lane Grp Cap(c), veh/h	417	0	1147	380	1180	1000	274	302	256	290	0	274
V/C Ratio(X)	0.06	0.00	0.72	0.17	0.58	0.14	0.08	0.06	0.31	0.57	0.00	0.19
Avail Cap(c_a), veh/h	537	0	1147	461	1180	1000	380	449	381	393	0	408
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	6.6	0.0	10.4	8.7	8.2	5.7	30.2	28.2	29.4	32.7	0.0	28.8
Incr Delay (d2), s/veh	0.1	0.0	3.9	0.2	2.1	0.3	0.1	0.1	0.7	1.8	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	9.1	0.3	6.0	0.8	0.4	0.3	1.3	3.1	0.0	0.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	6.7	0.0	14.3	8.9	10.3	6.0	30.4	28.3	30.1	34.5	0.0	29.1
LnGrp LOS	A	A	B	A	B	A	C	C	C	C	A	C
Approach Vol, veh/h		846			893			122			217	
Approach Delay, s/veh		14.0			9.5			29.9			33.2	
Approach LOS		B			A			C			C	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.3	54.0		17.6	6.6	55.7		17.6				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	7.5	49.5		19.5	7.5	49.5		19.5				
Max Q Clear Time (g_c+I1), s	3.0	26.3		12.7	2.4	19.0		5.6				
Green Ext Time (p_c), s	0.0	6.3		0.4	0.0	5.7		0.3				
Intersection Summary												
HCM 6th Ctrl Delay			15.0									
HCM 6th LOS			B									

HCM 6th Roundabout
 5: I-5 SB on ramp/I-5 SB off ramp & Slater Rd

Intersection				
Intersection Delay, s/veh	12.5			
Intersection LOS	B			
Approach	EB	WB	NB	SB
Entry Lanes	1	1	0	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	1032	976	0	236
Demand Flow Rate, veh/h	1053	1005	0	255
Vehicles Circulating, veh/h	353	0	501	1005
Vehicles Exiting, veh/h	907	501	248	0
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	10.5	13.2	0.0	18.5
Approach LOS	B	B	-	C
Lane	Left	Bypass	Left	Left
Designated Moves	T	R	LT	LTR
Assumed Moves	T	R	LT	LTR
RT Channelized	Yield			
Lane Util	1.000		1.000	1.000
Follow-Up Headway, s	2.609		2.609	2.609
Critical Headway, s	4.976	657	4.976	4.976
Entry Flow, veh/h	396	1071	1005	255
Cap Entry Lane, veh/h	963	0.980	1380	495
Entry HV Adj Factor	0.980	644	0.971	0.925
Flow Entry, veh/h	388	1050	976	236
Cap Entry, veh/h	944	0.613	1340	458
V/C Ratio	0.411	11.8	0.728	0.515
Control Delay, s/veh	8.5	B	13.2	18.5
LOS	A	4	B	C
95th %tile Queue, veh	2		7	3

HCM 6th Roundabout
 6: I-5 NB off ramp/I-5 NB on ramp & Slater Rd

Intersection				
Intersection Delay, s/veh	15.3			
Intersection LOS	C			
Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	0
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	469	708	641	0
Demand Flow Rate, veh/h	483	722	666	0
Vehicles Circulating, veh/h	0	542	483	971
Vehicles Exiting, veh/h	971	607	0	123
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	5.9	14.7	22.9	0.0
Approach LOS	A	B	C	-
Lane	Left	Left	Bypass	Left
Designated Moves	LT	T	R	LTR
Assumed Moves	LT	T	R	LTR
RT Channelized			Yield	
Lane Util	1.000	1.000		1.000
Follow-Up Headway, s	2.609	2.609		2.609
Critical Headway, s	4.976	4.976	170	4.976
Entry Flow, veh/h	483	552	1217	666
Cap Entry Lane, veh/h	1380	794	0.980	843
Entry HV Adj Factor	0.972	0.980	167	0.962
Flow Entry, veh/h	469	541	1193	641
Cap Entry, veh/h	1341	778	0.140	811
V/C Ratio	0.350	0.695	4.2	0.790
Control Delay, s/veh	5.9	17.9	A	22.9
LOS	A	C	0	C
95th %tile Queue, veh	2	6		8

HCM 6th AWSC
1: Lake Terrell Rd & Slater Rd

Intersection	
Intersection Delay, s/veh	11.7
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	13	42	2	58	76	0	3	16	45	316	19	30
Future Vol, veh/h	13	42	2	58	76	0	3	16	45	316	19	30
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Heavy Vehicles, %	0	0	0	1	1	1	0	0	0	1	1	1
Mvmt Flow	15	48	2	67	87	0	3	18	52	363	22	34
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	9	9.9	8.1	13.4
HCM LOS	A	A	A	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	5%	23%	43%	87%
Vol Thru, %	25%	74%	57%	5%
Vol Right, %	70%	4%	0%	8%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	64	57	134	365
LT Vol	3	13	58	316
Through Vol	16	42	76	19
RT Vol	45	2	0	30
Lane Flow Rate	74	66	154	420
Geometry Grp	1	1	1	1
Degree of Util (X)	0.093	0.097	0.225	0.548
Departure Headway (Hd)	4.568	5.325	5.267	4.699
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	776	667	676	764
Service Time	2.644	3.407	3.339	2.75
HCM Lane V/C Ratio	0.095	0.099	0.228	0.55
HCM Control Delay	8.1	9	9.9	13.4
HCM Lane LOS	A	A	A	B
HCM 95th-tile Q	0.3	0.3	0.9	3.4

HCM 6th AWSC
 2: Lake Terrell Rd & Unick Rd

Intersection

Intersection Delay, s/veh	10.3
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	120	5	144	0	1	2	5	109	0	4	157	13
Future Vol, veh/h	120	5	144	0	1	2	5	109	0	4	157	13
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Heavy Vehicles, %	2	2	2	0	0	0	0	0	0	1	1	1
Mvmt Flow	150	6	180	0	1	3	6	136	0	5	196	16
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	11	7.9	9.3	10
HCM LOS	B	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	4%	45%	0%	2%
Vol Thru, %	96%	2%	33%	90%
Vol Right, %	0%	54%	67%	7%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	114	269	3	174
LT Vol	5	120	0	4
Through Vol	109	5	1	157
RT Vol	0	144	2	13
Lane Flow Rate	142	336	4	218
Geometry Grp	1	1	1	1
Degree of Util (X)	0.197	0.427	0.005	0.294
Departure Headway (Hd)	4.988	4.576	4.802	4.862
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	714	783	737	735
Service Time	3.055	2.628	2.888	2.923
HCM Lane V/C Ratio	0.199	0.429	0.005	0.297
HCM Control Delay	9.3	11	7.9	10
HCM Lane LOS	A	B	A	A
HCM 95th-tile Q	0.7	2.2	0	1.2

HCM 2010 Signalized Intersection Summary 3: Haxton Way & Slater Rd

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	381	55	275	214	37	62	52	308	15	36	7
Future Volume (veh/h)	1	381	55	275	214	37	62	52	308	15	36	7
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1900	1863	1863	1900	1863	1900
Adj Flow Rate, veh/h	1	423	61	306	238	41	69	58	342	17	40	8
Adj No. of Lanes	1	1	0	1	1	0	0	1	1	0	1	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	623	869	125	461	846	146	327	250	492	160	342	60
Arrive On Green	0.55	0.55	0.55	0.55	0.55	0.55	0.31	0.31	0.31	0.31	0.31	0.31
Sat Flow, veh/h	1096	1593	230	908	1549	267	767	805	1583	281	1101	194
Grp Volume(v), veh/h	1	0	484	306	0	279	127	0	342	65	0	0
Grp Sat Flow(s),veh/h/ln	1096	0	1822	908	0	1816	1573	0	1583	1576	0	0
Q Serve(g_s), s	0.0	0.0	10.3	19.7	0.0	5.2	1.8	0.0	11.9	0.0	0.0	0.0
Cycle Q Clear(g_c), s	5.2	0.0	10.3	30.0	0.0	5.2	3.5	0.0	11.9	1.6	0.0	0.0
Prop In Lane	1.00		0.13	1.00		0.15	0.54		1.00	0.26		0.12
Lane Grp Cap(c), veh/h	623	0	995	461	0	991	577	0	492	562	0	0
V/C Ratio(X)	0.00	0.00	0.49	0.66	0.00	0.28	0.22	0.00	0.70	0.12	0.00	0.00
Avail Cap(c_a), veh/h	749	0	1205	566	0	1200	577	0	492	562	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	9.0	0.0	8.8	18.1	0.0	7.6	16.1	0.0	19.0	15.5	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.4	2.1	0.0	0.2	0.9	0.0	7.9	0.4	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	5.2	5.2	0.0	2.6	1.8	0.0	6.2	0.9	0.0	0.0
LnGrp Delay(d),s/veh	9.0	0.0	9.2	20.2	0.0	7.8	16.9	0.0	26.9	15.9	0.0	0.0
LnGrp LOS	A		A	C		A	B		C	B		
Approach Vol, veh/h		485			585			469			65	
Approach Delay, s/veh		9.2			14.3			24.2			15.9	
Approach LOS		A			B			C			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		38.8		24.0		38.8		24.0				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		41.5		19.5		41.5		19.5				
Max Q Clear Time (g_c+I1), s		12.3		3.6		32.0		13.9				
Green Ext Time (p_c), s		2.8		0.2		2.2		1.0				
Intersection Summary												
HCM 2010 Ctrl Delay				15.7								
HCM 2010 LOS				B								

HCM 2010 Signalized Intersection Summary

4: Rural Ave & Slater Rd

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	22	772	12	56	612	126	20	17	70	146	18	27
Future Volume (veh/h)	22	772	12	56	612	126	20	17	70	146	18	27
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1845	1900	1827	1827	1827	1827	1827	1827	1845	1845	1900
Adj Flow Rate, veh/h	25	877	14	64	695	143	23	19	80	166	20	31
Adj No. of Lanes	1	1	0	1	1	1	1	1	1	1	1	0
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	3	3	3	4	4	4	4	4	4	3	3	3
Cap, veh/h	408	1121	18	332	1169	993	273	301	256	289	108	167
Arrive On Green	0.03	0.62	0.62	0.05	0.64	0.64	0.16	0.16	0.16	0.16	0.16	0.16
Sat Flow, veh/h	1757	1811	29	1740	1827	1553	1322	1827	1553	1278	653	1013
Grp Volume(v), veh/h	25	0	891	64	695	143	23	19	80	166	0	51
Grp Sat Flow(s),veh/h/ln	1757	0	1840	1740	1827	1553	1322	1827	1553	1278	0	1666
Q Serve(g_s), s	0.4	0.0	28.6	1.0	17.7	2.9	1.2	0.7	3.6	10.1	0.0	2.1
Cycle Q Clear(g_c), s	0.4	0.0	28.6	1.0	17.7	2.9	3.3	0.7	3.6	10.8	0.0	2.1
Prop In Lane	1.00		0.02	1.00		1.00	1.00		1.00	1.00		0.61
Lane Grp Cap(c), veh/h	408	0	1139	332	1169	993	273	301	256	289	0	275
V/C Ratio(X)	0.06	0.00	0.78	0.19	0.59	0.14	0.08	0.06	0.31	0.57	0.00	0.19
Avail Cap(c_a), veh/h	526	0	1139	412	1169	993	378	445	379	391	0	406
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	6.8	0.0	11.3	10.3	8.4	5.7	30.2	28.2	29.4	32.7	0.0	28.8
Incr Delay (d2), s/veh	0.1	0.0	5.4	0.3	2.2	0.3	0.1	0.1	0.7	1.8	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.0	16.1	0.6	9.6	1.3	0.5	0.4	1.6	3.7	0.0	1.0
LnGrp Delay(d),s/veh	6.8	0.0	16.6	10.6	10.6	6.0	30.3	28.3	30.1	34.5	0.0	29.1
LnGrp LOS	A		B	B	B	A	C	C	C	C		C
Approach Vol, veh/h		916			902			122				217
Approach Delay, s/veh		16.4			9.9			29.9				33.2
Approach LOS		B			A			C				C
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.3	54.0		17.7	6.6	55.7		17.7				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	7.5	49.5		19.5	7.5	49.5		19.5				
Max Q Clear Time (g_c+I1), s	3.0	30.6		12.8	2.4	19.7		5.6				
Green Ext Time (p_c), s	0.0	6.6		0.4	0.0	5.8		0.3				
Intersection Summary												
HCM 2010 Ctrl Delay			16.1									
HCM 2010 LOS			B									

HCM 6th Roundabout
 5: I-5 SB on ramp/I-5 SB off ramp & Slater Rd

Intersection				
Intersection Delay, s/veh	13.2			
Intersection LOS	B			
Approach	EB	WB	NB	SB
Entry Lanes	1	1	0	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	1098	984	0	236
Demand Flow Rate, veh/h	1120	1013	0	255
Vehicles Circulating, veh/h	353	0	504	1013
Vehicles Exiting, veh/h	915	504	248	0
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	11.8	13.4	0.0	18.8
Approach LOS	B	B	-	C
Lane	Left	Bypass	Left	Left
Designated Moves	T	R	LT	LTR
Assumed Moves	T	R	LT	LTR
RT Channelized	Yield			
Lane Util	1.000		1.000	1.000
Follow-Up Headway, s	2.609		2.609	2.609
Critical Headway, s	4.976	721	4.976	4.976
Entry Flow, veh/h	399	1071	1013	255
Cap Entry Lane, veh/h	963	0.980	1380	491
Entry HV Adj Factor	0.980	707	0.971	0.925
Flow Entry, veh/h	391	1050	984	236
Cap Entry, veh/h	944	0.673	1340	454
V/C Ratio	0.414	13.5	0.734	0.519
Control Delay, s/veh	8.6	B	13.4	18.8
LOS	A	5	B	C
95th %tile Queue, veh	2		7	3

HCM 6th Roundabout
 6: I-5 NB off ramp/I-5 NB on ramp & Slater Rd

Intersection				
Intersection Delay, s/veh	15.8			
Intersection LOS	C			
Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	0
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	472	708	650	0
Demand Flow Rate, veh/h	486	722	675	0
Vehicles Circulating, veh/h	0	551	486	980
Vehicles Exiting, veh/h	980	610	0	123
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	5.9	15.0	23.9	0.0
Approach LOS	A	C	C	-
Lane	Left	Left	Bypass	Left
Designated Moves	LT	T	R	LTR
Assumed Moves	LT	T	R	LTR
RT Channelized			Yield	
Lane Util	1.000	1.000		1.000
Follow-Up Headway, s	2.609	2.609		2.609
Critical Headway, s	4.976	4.976	170	4.976
Entry Flow, veh/h	486	552	1217	675
Cap Entry Lane, veh/h	1380	787	0.980	841
Entry HV Adj Factor	0.972	0.980	167	0.963
Flow Entry, veh/h	472	541	1193	650
Cap Entry, veh/h	1341	771	0.140	809
V/C Ratio	0.352	0.702	4.2	0.803
Control Delay, s/veh	5.9	18.4	A	23.9
LOS	A	C	0	C
95th %tile Queue, veh	2	6		9

HCM 6th TWSC
 8: Lake Terrell Rd & Green Apple East Exit

Intersection						
Int Delay, s/veh	1.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	Y			↑	↑	
Traffic Vol, veh/h	7	62	0	112	300	0
Future Vol, veh/h	7	62	0	112	300	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	8	67	0	122	326	0

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	448	326	-	0	-	0
Stage 1	326	-	-	-	-	-
Stage 2	122	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	-	-
Pot Cap-1 Maneuver	568	715	0	-	-	0
Stage 1	731	-	0	-	-	0
Stage 2	903	-	0	-	-	0
Platoon blocked, %				-	-	
Mov Cap-1 Maneuver	568	715	-	-	-	-
Mov Cap-2 Maneuver	568	-	-	-	-	-
Stage 1	731	-	-	-	-	-
Stage 2	903	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.8	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT EBLn1	SBT
Capacity (veh/h)	- 697	-
HCM Lane V/C Ratio	- 0.108	-
HCM Control Delay (s)	- 10.8	-
HCM Lane LOS	- B	-
HCM 95th %tile Q(veh)	- 0.4	-

HCM 6th AWSC
1: Lake Terrell Rd & Slater Rd

Intersection	
Intersection Delay, s/veh	15
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	18	59	3	82	107	0	4	22	62	355	27	42
Future Vol, veh/h	18	59	3	82	107	0	4	22	62	355	27	42
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Heavy Vehicles, %	0	0	0	1	1	1	0	0	0	1	1	1
Mvmt Flow	21	68	3	94	123	0	5	25	71	408	31	48
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	10	11.8	9	18.7
HCM LOS	A	B	A	C

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	5%	23%	43%	84%
Vol Thru, %	25%	74%	57%	6%
Vol Right, %	70%	4%	0%	10%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	88	80	189	424
LT Vol	4	18	82	355
Through Vol	22	59	107	27
RT Vol	62	3	0	42
Lane Flow Rate	101	92	217	487
Geometry Grp	1	1	1	1
Degree of Util (X)	0.144	0.15	0.345	0.689
Departure Headway (Hd)	5.129	5.886	5.724	5.092
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	698	608	628	712
Service Time	3.171	3.933	3.763	3.119
HCM Lane V/C Ratio	0.145	0.151	0.346	0.684
HCM Control Delay	9	10	11.8	18.7
HCM Lane LOS	A	A	B	C
HCM 95th-tile Q	0.5	0.5	1.5	5.5

HCM 6th AWSC
2: Lake Terrell Rd & Unick Rd

Intersection	
Intersection Delay, s/veh	14.9
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	168	7	202	0	1	3	7	143	0	6	218	18
Future Vol, veh/h	168	7	202	0	1	3	7	143	0	6	218	18
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Heavy Vehicles, %	2	2	2	0	0	0	0	0	0	1	1	1
Mvmt Flow	210	9	253	0	1	4	9	179	0	8	273	23
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	17.5	8.7	11.1	13.2
HCM LOS	C	A	B	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	5%	45%	0%	2%
Vol Thru, %	95%	2%	25%	90%
Vol Right, %	0%	54%	75%	7%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	150	377	4	242
LT Vol	7	168	0	6
Through Vol	143	7	1	218
RT Vol	0	202	3	18
Lane Flow Rate	188	471	5	302
Geometry Grp	1	1	1	1
Degree of Util (X)	0.297	0.663	0.008	0.461
Departure Headway (Hd)	5.695	5.063	5.622	5.483
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	630	712	633	656
Service Time	3.742	3.101	3.69	3.524
HCM Lane V/C Ratio	0.298	0.662	0.008	0.46
HCM Control Delay	11.1	17.5	8.7	13.2
HCM Lane LOS	B	C	A	B
HCM 95th-tile Q	1.2	5	0	2.4

HCM 6th Signalized Intersection Summary 3: Haxton Way & Slater Rd

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	449	76	385	288	52	86	73	431	21	51	10
Future Volume (veh/h)	1	449	76	385	288	52	86	73	431	21	51	10
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	1	499	84	428	320	58	96	81	479	23	57	11
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	591	925	156	437	913	166	294	226	442	135	302	51
Arrive On Green	0.59	0.59	0.59	0.59	0.59	0.59	0.28	0.28	0.28	0.28	0.28	0.28
Sat Flow, veh/h	1005	1560	263	832	1541	279	771	812	1585	253	1086	184
Grp Volume(v), veh/h	1	0	583	428	0	378	177	0	479	91	0	0
Grp Sat Flow(s),veh/h/ln	1005	0	1823	832	0	1820	1583	0	1585	1523	0	0
Q Serve(g_s), s	0.0	0.0	13.4	28.1	0.0	7.5	2.9	0.0	19.5	0.0	0.0	0.0
Cycle Q Clear(g_c), s	7.5	0.0	13.4	41.5	0.0	7.5	5.9	0.0	19.5	5.7	0.0	0.0
Prop In Lane	1.00		0.14	1.00		0.15	0.54		1.00	0.25		0.12
Lane Grp Cap(c), veh/h	591	0	1081	437	0	1079	520	0	442	489	0	0
V/C Ratio(X)	0.00	0.00	0.54	0.98	0.00	0.35	0.34	0.00	1.08	0.19	0.00	0.00
Avail Cap(c_a), veh/h	591	0	1081	437	0	1079	520	0	442	489	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	9.3	0.0	8.5	24.0	0.0	7.3	20.2	0.0	25.2	19.2	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.5	37.7	0.0	0.2	1.8	0.0	67.6	0.8	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	3.7	11.3	0.0	2.0	2.4	0.0	15.0	1.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	9.3	0.0	9.1	61.7	0.0	7.5	22.0	0.0	92.9	20.0	0.0	0.0
LnGrp LOS	A	A	A	E	A	A	C	A	F	C	A	A
Approach Vol, veh/h		584			806			656				91
Approach Delay, s/veh		9.1			36.3			73.7				20.0
Approach LOS		A			D			E				C
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		46.0		24.0		46.0		24.0				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		41.5		19.5		41.5		19.5				
Max Q Clear Time (g_c+I1), s		15.4		7.7		43.5		21.5				
Green Ext Time (p_c), s		3.5		0.3		0.0		0.0				
Intersection Summary												
HCM 6th Ctrl Delay				39.7								
HCM 6th LOS				D								

HCM 6th Signalized Intersection Summary

4: Rural Ave & Slater Rd

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	999	15	79	846	177	28	24	98	205	25	37
Future Volume (veh/h)	30	999	15	79	846	177	28	24	98	205	25	37
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1841	1841	1841	1841	1841	1841	1856	1856	1856
Adj Flow Rate, veh/h	34	1135	17	90	961	201	32	27	111	233	28	42
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	3	3	3	4	4	4	4	4	4	3	3	3
Cap, veh/h	211	1045	16	173	1090	924	326	403	342	341	147	220
Arrive On Green	0.03	0.57	0.57	0.05	0.59	0.59	0.22	0.22	0.22	0.22	0.22	0.22
Sat Flow, veh/h	1767	1823	27	1753	1841	1560	1310	1841	1560	1241	670	1005
Grp Volume(v), veh/h	34	0	1152	90	961	201	32	27	111	233	0	70
Grp Sat Flow(s),veh/h/ln	1767	0	1851	1753	1841	1560	1310	1841	1560	1241	0	1675
Q Serve(g_s), s	0.7	0.0	49.5	1.8	38.4	5.2	1.8	1.0	5.2	15.8	0.0	2.9
Cycle Q Clear(g_c), s	0.7	0.0	49.5	1.8	38.4	5.2	4.7	1.0	5.2	16.8	0.0	2.9
Prop In Lane	1.00		0.01	1.00		1.00	1.00		1.00	1.00		0.60
Lane Grp Cap(c), veh/h	211	0	1061	173	1090	924	326	403	342	341	0	367
V/C Ratio(X)	0.16	0.00	1.09	0.52	0.88	0.22	0.10	0.07	0.32	0.68	0.00	0.19
Avail Cap(c_a), veh/h	307	0	1061	236	1090	924	335	416	352	349	0	378
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	15.3	0.0	18.4	20.6	15.0	8.2	29.4	26.7	28.3	33.4	0.0	27.5
Incr Delay (d2), s/veh	0.4	0.0	53.9	2.4	10.3	0.5	0.1	0.1	0.5	5.3	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	33.6	1.1	16.5	1.7	0.6	0.4	1.9	5.1	0.0	1.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	15.6	0.0	72.3	23.0	25.3	8.8	29.5	26.8	28.9	38.6	0.0	27.7
LnGrp LOS	B	A	F	C	C	A	C	C	C	D	A	C
Approach Vol, veh/h		1186			1252			170			303	
Approach Delay, s/veh		70.7			22.5			28.7			36.1	
Approach LOS		E			C			C			D	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.9	54.0		23.4	7.3	55.6		23.4				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	7.5	49.5		19.5	7.5	49.5		19.5				
Max Q Clear Time (g_c+I1), s	3.8	51.5		18.8	2.7	40.4		7.2				
Green Ext Time (p_c), s	0.1	0.0		0.1	0.0	5.1		0.4				
Intersection Summary												
HCM 6th Ctrl Delay			43.9									
HCM 6th LOS			D									

HCM 6th Roundabout
 5: I-5 SB on ramp/I-5 SB off ramp & Slater Rd

Intersection				
Intersection Delay, s/veh	47.1			
Intersection LOS	E			
Approach	EB	WB	NB	SB
Entry Lanes	1	1	0	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	1446	1367	0	331
Demand Flow Rate, veh/h	1475	1408	0	358
Vehicles Circulating, veh/h	495	0	701	1408
Vehicles Exiting, veh/h	1271	701	348	0
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	30.7	47.7	0.0	116.2
Approach LOS	D	E	-	F
Lane	Left	Bypass	Left	Left
Designated Moves	T	R	LT	LTR
Assumed Moves	T	R	LT	LTR
RT Channelized	Yield			
Lane Util	1.000		1.000	1.000
Follow-Up Headway, s	2.609		2.609	2.609
Critical Headway, s	4.976	921	4.976	4.976
Entry Flow, veh/h	554	968	1408	358
Cap Entry Lane, veh/h	833	0.980	1380	328
Entry HV Adj Factor	0.980	903	0.971	0.924
Flow Entry, veh/h	543	949	1367	331
Cap Entry, veh/h	817	0.952	1340	303
V/C Ratio	0.665	39.5	1.020	1.091
Control Delay, s/veh	16.0	E	47.7	116.2
LOS	C	16	F	F
95th %tile Queue, veh	5		24	13

HCM 6th Roundabout
 6: I-5 NB off ramp/I-5 NB on ramp & Slater Rd

Intersection				
Intersection Delay, s/veh	108.8			
Intersection LOS	F			
Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	0
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	657	990	900	0
Demand Flow Rate, veh/h	677	1010	936	0
Vehicles Circulating, veh/h	0	763	677	1361
Vehicles Exiting, veh/h	1361	850	0	174
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	7.7	104.1	187.8	0.0
Approach LOS	A	F	F	-
Lane	Left	Left	Bypass	Left
Designated Moves	LT	T	R	LTR
Assumed Moves	LT	T	R	LTR
RT Channelized			Yield	
Lane Util	1.000	1.000		1.000
Follow-Up Headway, s	2.609	2.609		2.609
Critical Headway, s	4.976	4.976	238	4.976
Entry Flow, veh/h	677	772	1155	936
Cap Entry Lane, veh/h	1380	634	0.980	692
Entry HV Adj Factor	0.971	0.980	233	0.961
Flow Entry, veh/h	657	757	1133	900
Cap Entry, veh/h	1339	621	0.206	665
V/C Ratio	0.491	1.218	5.0	1.353
Control Delay, s/veh	7.7	134.7	A	187.8
LOS	A	F	1	F
95th %tile Queue, veh	3	27		38

HCM 6th AWSC
1: Lake Terrell Rd & Slater Rd

Intersection	
Intersection Delay, s/veh	19.3
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	18	59	3	82	107	0	4	22	62	417	27	42
Future Vol, veh/h	18	59	3	82	107	0	4	22	62	417	27	42
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Heavy Vehicles, %	0	0	0	1	1	1	0	0	0	1	1	1
Mvmt Flow	21	68	3	94	123	0	5	25	71	479	31	48
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	10.3	12.3	9.3	25.3
HCM LOS	B	B	A	D

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	5%	23%	43%	86%
Vol Thru, %	25%	74%	57%	6%
Vol Right, %	70%	4%	0%	9%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	88	80	189	486
LT Vol	4	18	82	417
Through Vol	22	59	107	27
RT Vol	62	3	0	42
Lane Flow Rate	101	92	217	559
Geometry Grp	1	1	1	1
Degree of Util (X)	0.148	0.156	0.358	0.797
Departure Headway (Hd)	5.282	6.124	5.94	5.139
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	677	584	604	704
Service Time	3.333	4.18	3.988	3.171
HCM Lane V/C Ratio	0.149	0.158	0.359	0.794
HCM Control Delay	9.3	10.3	12.3	25.3
HCM Lane LOS	A	B	B	D
HCM 95th-tile Q	0.5	0.5	1.6	8.1

HCM 6th AWSC
2: Lake Terrell Rd & Unick Rd

Intersection	
Intersection Delay, s/veh	15
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	168	7	202	0	1	3	7	150	0	6	219	18
Future Vol, veh/h	168	7	202	0	1	3	7	150	0	6	219	18
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Heavy Vehicles, %	2	2	2	0	0	0	0	0	0	1	1	1
Mvmt Flow	210	9	253	0	1	4	9	188	0	8	274	23
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0
Approach	EB			WB			NB			SB		
Opposing Approach	WB			EB			SB			NB		
Opposing Lanes	1			1			1			1		
Conflicting Approach Left	SB			NB			EB			WB		
Conflicting Lanes Left	1			1			1			1		
Conflicting Approach Right	NB			SB			WB			EB		
Conflicting Lanes Right	1			1			1			1		
HCM Control Delay	17.8			8.8			11.3			13.3		
HCM LOS	C			A			B			B		

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	4%	45%	0%	2%
Vol Thru, %	96%	2%	25%	90%
Vol Right, %	0%	54%	75%	7%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	157	377	4	243
LT Vol	7	168	0	6
Through Vol	150	7	1	219
RT Vol	0	202	3	18
Lane Flow Rate	196	471	5	304
Geometry Grp	1	1	1	1
Degree of Util (X)	0.311	0.667	0.008	0.464
Departure Headway (Hd)	5.706	5.093	5.666	5.505
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	628	707	628	653
Service Time	3.754	3.129	3.733	3.549
HCM Lane V/C Ratio	0.312	0.666	0.008	0.466
HCM Control Delay	11.3	17.8	8.8	13.3
HCM Lane LOS	B	C	A	B
HCM 95th-tile Q	1.3	5.1	0	2.5

HCM 6th Signalized Intersection Summary 3: Haxton Way & Slater Rd

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	510	77	385	296	52	86	73	431	21	51	10
Future Volume (veh/h)	1	510	77	385	296	52	86	73	431	21	51	10
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	1	567	86	428	329	58	96	81	479	23	57	11
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	584	941	143	388	918	162	294	226	442	135	302	51
Arrive On Green	0.59	0.59	0.59	0.59	0.59	0.59	0.28	0.28	0.28	0.28	0.28	0.28
Sat Flow, veh/h	997	1586	241	779	1548	273	771	812	1585	253	1086	184
Grp Volume(v), veh/h	1	0	653	428	0	387	177	0	479	91	0	0
Grp Sat Flow(s),veh/h/ln	997	0	1827	779	0	1821	1583	0	1585	1523	0	0
Q Serve(g_s), s	0.0	0.0	15.9	25.6	0.0	7.7	2.9	0.0	19.5	0.0	0.0	0.0
Cycle Q Clear(g_c), s	7.7	0.0	15.9	41.5	0.0	7.7	5.9	0.0	19.5	5.7	0.0	0.0
Prop In Lane	1.00		0.13	1.00		0.15	0.54		1.00	0.25		0.12
Lane Grp Cap(c), veh/h	584	0	1083	388	0	1080	520	0	442	489	0	0
V/C Ratio(X)	0.00	0.00	0.60	1.10	0.00	0.36	0.34	0.00	1.08	0.19	0.00	0.00
Avail Cap(c_a), veh/h	584	0	1083	388	0	1080	520	0	442	489	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	9.4	0.0	9.0	25.6	0.0	7.4	20.2	0.0	25.2	19.2	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.9	76.0	0.0	0.2	1.8	0.0	67.6	0.8	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	4.5	14.3	0.0	2.1	2.4	0.0	15.0	1.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	9.4	0.0	10.0	101.6	0.0	7.6	22.0	0.0	92.9	20.0	0.0	0.0
LnGrp LOS	A	A	A	F	A	A	C	A	F	C	A	A
Approach Vol, veh/h		654			815			656			91	
Approach Delay, s/veh		10.0			56.9			73.7			20.0	
Approach LOS		A			E			E			C	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		46.0		24.0		46.0		24.0				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		41.5		19.5		41.5		19.5				
Max Q Clear Time (g_c+I1), s		17.9		7.7		43.5		21.5				
Green Ext Time (p_c), s		4.0		0.3		0.0		0.0				
Intersection Summary												
HCM 6th Ctrl Delay				46.5								
HCM 6th LOS				D								

HCM 6th Signalized Intersection Summary

4: Rural Ave & Slater Rd

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	31	1058	16	79	854	177	28	24	98	205	25	37
Future Volume (veh/h)	31	1058	16	79	854	177	28	24	98	205	25	37
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1841	1841	1841	1841	1841	1841	1856	1856	1856
Adj Flow Rate, veh/h	35	1202	18	90	970	201	32	27	111	233	28	42
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	3	3	3	4	4	4	4	4	4	3	3	3
Cap, veh/h	207	1045	16	173	1089	923	326	403	342	341	147	220
Arrive On Green	0.03	0.57	0.57	0.05	0.59	0.59	0.22	0.22	0.22	0.22	0.22	0.22
Sat Flow, veh/h	1767	1823	27	1753	1841	1560	1310	1841	1560	1241	670	1005
Grp Volume(v), veh/h	35	0	1220	90	970	201	32	27	111	233	0	70
Grp Sat Flow(s),veh/h/ln	1767	0	1851	1753	1841	1560	1310	1841	1560	1241	0	1675
Q Serve(g_s), s	0.7	0.0	49.5	1.8	39.3	5.2	1.8	1.0	5.2	15.8	0.0	2.9
Cycle Q Clear(g_c), s	0.7	0.0	49.5	1.8	39.3	5.2	4.7	1.0	5.2	16.8	0.0	2.9
Prop In Lane	1.00		0.01	1.00		1.00	1.00		1.00	1.00		0.60
Lane Grp Cap(c), veh/h	207	0	1061	173	1089	923	326	403	342	341	0	367
V/C Ratio(X)	0.17	0.00	1.15	0.52	0.89	0.22	0.10	0.07	0.32	0.68	0.00	0.19
Avail Cap(c_a), veh/h	302	0	1061	236	1089	923	335	416	352	349	0	378
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	15.7	0.0	18.4	20.6	15.2	8.3	29.4	26.7	28.3	33.4	0.0	27.5
Incr Delay (d2), s/veh	0.4	0.0	78.6	2.4	11.0	0.5	0.1	0.1	0.5	5.3	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	40.9	1.1	17.0	1.7	0.6	0.4	1.9	5.1	0.0	1.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	16.1	0.0	97.0	23.0	26.2	8.8	29.5	26.8	28.9	38.6	0.0	27.7
LnGrp LOS	B	A	F	C	C	A	C	C	C	D	A	C
Approach Vol, veh/h		1255			1261			170			303	
Approach Delay, s/veh		94.7			23.2			28.7			36.1	
Approach LOS		F			C			C			D	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.9	54.0		23.4	7.3	55.6		23.4				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	7.5	49.5		19.5	7.5	49.5		19.5				
Max Q Clear Time (g_c+I1), s	3.8	51.5		18.8	2.7	41.3		7.2				
Green Ext Time (p_c), s	0.1	0.0		0.1	0.0	4.8		0.4				
Intersection Summary												
HCM 6th Ctrl Delay				54.9								
HCM 6th LOS				D								

HCM 6th Roundabout
 5: I-5 SB on ramp/I-5 SB off ramp & Slater Rd

Intersection				
Intersection Delay, s/veh	52.7			
Intersection LOS	F			
Approach	EB	WB	NB	SB
Entry Lanes	1	1	0	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	1513	1376	0	331
Demand Flow Rate, veh/h	1543	1417	0	358
Vehicles Circulating, veh/h	495	0	705	1417
Vehicles Exiting, veh/h	1280	705	348	0
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	40.9	49.5	0.0	119.9
Approach LOS	E	E	-	F
Lane	Left	Bypass	Left	Left
Designated Moves	T	R	LT	LTR
Assumed Moves	T	R	LT	LTR
RT Channelized	Yield			
Lane Util	1.000		1.000	1.000
Follow-Up Headway, s	2.609		2.609	2.609
Critical Headway, s	4.976	985	4.976	4.976
Entry Flow, veh/h	558	968	1417	358
Cap Entry Lane, veh/h	833	0.980	1380	325
Entry HV Adj Factor	0.980	966	0.971	0.924
Flow Entry, veh/h	547	949	1376	331
Cap Entry, veh/h	817	1.018	1340	301
V/C Ratio	0.670	54.8	1.027	1.101
Control Delay, s/veh	16.2	F	49.5	119.9
LOS	C	20	F	F
95th %tile Queue, veh	5		25	13

HCM 6th Roundabout
 6: I-5 NB off ramp/I-5 NB on ramp & Slater Rd

Intersection				
Intersection Delay, s/veh	112.6			
Intersection LOS	F			
Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	0
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	660	990	908	0
Demand Flow Rate, veh/h	680	1010	944	0
Vehicles Circulating, veh/h	0	771	680	1369
Vehicles Exiting, veh/h	1369	853	0	174
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	7.7	107.3	194.5	0.0
Approach LOS	A	F	F	-
Lane	Left	Left	Bypass	Left
Designated Moves	LT	T	R	LTR
Assumed Moves	LT	T	R	LTR
RT Channelized			Yield	
Lane Util	1.000	1.000		1.000
Follow-Up Headway, s	2.609	2.609		2.609
Critical Headway, s	4.976	4.976	238	4.976
Entry Flow, veh/h	680	772	1155	944
Cap Entry Lane, veh/h	1380	629	0.980	690
Entry HV Adj Factor	0.971	0.980	233	0.962
Flow Entry, veh/h	660	757	1133	908
Cap Entry, veh/h	1339	616	0.206	663
V/C Ratio	0.493	1.228	5.0	1.369
Control Delay, s/veh	7.7	138.8	A	194.5
LOS	A	F	1	F
95th %tile Queue, veh	3	28		39

HCM 6th TWSC
 8: Lake Terrell Rd & Green Apple East Exit

Intersection						
Int Delay, s/veh	1.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	TT			↑	↑	
Traffic Vol, veh/h	7	62	0	158	420	0
Future Vol, veh/h	7	62	0	158	420	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	8	67	0	172	457	0

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	629	457	-	0	-	0
Stage 1	457	-	-	-	-	-
Stage 2	172	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	-	-
Pot Cap-1 Maneuver	446	604	0	-	-	0
Stage 1	638	-	0	-	-	0
Stage 2	858	-	0	-	-	0
Platoon blocked, %				-	-	
Mov Cap-1 Maneuver	446	604	-	-	-	-
Mov Cap-2 Maneuver	446	-	-	-	-	-
Stage 1	638	-	-	-	-	-
Stage 2	858	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.1	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT EBLn1	SBT
Capacity (veh/h)	- 583	-
HCM Lane V/C Ratio	- 0.129	-
HCM Control Delay (s)	- 12.1	-
HCM Lane LOS	- B	-
HCM 95th %tile Q(veh)	- 0.4	-